



PDP-MONITOR

Chassis : D71B(NP_42)_Pascal
Basic Model : PPM42M5SSX/EDC
Model : PPM42M5SSX/XAX

SERVICE *Manual*

PDP-MONITOR



PPM42M5SS

FEATURES

- World Wide Universal Model
- Video Wall Function
- Horizontal Display, Vertical Display
- Competitive PC Compatibility
- Enhanced Burning Protection Mode

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1. Precaution

To avoid possible damages or electric shocks or exposure to radiation, follow the instructions below with regard to safety, installation, service and ESD.

1-1 Safety Precautions

1. Make sure all protective devices are properly installed including non-metallic handles and compartment covers when installing or re-installing the chassis or chassis assemblies.
2. Make sure that no gaps exist between the cabinets for children to insert their fingers in to prevent children from receiving electric shocks. Gaps mentioned above include ventilation holes of a too great magnitude between the PDP module and the cabinet mask, and the improper installation of the rear cabinet.

Errors may occur when the resistance is below 1.0 M Ω or over 5.2 M Ω .

In these cases, make sure that the device is repaired before sending it back to the customer.

3. Check for Electricity Leakage (Figure 1-1)
Warning: Do not use an insulated transformer for checking the leakage. Use only those current leakage testers or mirroring systems that comply with ANSIC 101.1 and the Underwriter Laboratory's specifications (UL1410, 59.7).

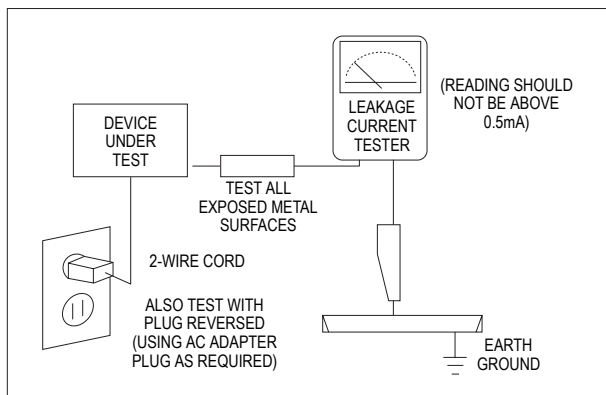


Fig. 1-1 AC Leakage Test

4. A high voltage is maintained within the specified limits using safety parts, calibration and tolerances. When voltage exceeds the specified limits, check each special part.



5. Warning for Engineering Changes:
Never make any changes or additions to the circuit design or the internal part for this product.
Ex: Do not add any audio or video accessory connectors. This might cause physical damage.
Furthermore, any changes or additions to the original design/engineering will invalidate the warranty.
6. Warning - Hot Chassis:
Some TV chassis are directly connected to one end of the AC power cord for electrical reasons.
Without insulated transformers, the product can only be repaired safely when the chassis is connected to the earthed end of the AC power source.

To make sure the AC power cord is properly connected, follow the instructions below. Use the voltmeter to measure the voltage between the chassis and the earthed ground. If the measurement is over 1.0V, unplug the AC power cord and change the polarity before re-inserting it. Measure the voltage between the chassis and the ground again.

7. Some TV chassis are shipped with an additional secondary grounding system. The secondary system is adjacent to the AC power line. These two grounding systems are separated in the circuit using an unbreakable/unchangeable insulation material.
8. When any parts, material or wiring appear overheated or damaged, replace them with new regular ones immediately. When any damage or overheating is detected, correct this immediately and make a regular check of possible errors.
9. Check for the original shape of the lead, especially that of the antenna wiring, any sharp edges, the AC power and the high voltage power. Carefully check if the wiring is too tight, incorrectly placed or loose. Never change the space between the part and the printed circuit board. Check the AC power cord for possible damages. Keep the part or the lead away from any heat-emitting materials.

10. Safety Indication:

Some electrical circuits or device related materials require special attention to their safety features, which cannot be viewed by the naked eye. If an original part is replaced with another irregular one, the safety or protective features will be lost even if the new one has a higher voltage or more watts.

Critical safety parts should be bracketed with ( ).
Use only regular parts for replacements (in particular, flame resistance and dielectric strength specifications).
Irregular parts or materials may cause electric shock or fire.

1-2 Servicing Precautions

Warning 1: First carefully read the "Safety Instruction" in this service manual.

When there is a conflict between the service and the safety instructions, follow the safety instruction at all times.

Warning 2: Any electrolytic capacitor with the wrong polarity will explode.

1. The service instructions are printed on the cabinet, and should be followed by any service personnel.
2. Make sure to unplug the AC power cord from the power source before starting any repairs.
 - (a) Remove or re-install parts or assemblies.
 - (b) Disconnect the electric plug or connector, if any.
 - (c) Connect the test part in parallel with the electrolytic capacitor.
3. Some parts are placed at a higher position than the printed board. Insulated tubes or tapes are used for this purpose. The internal wiring is clamped using buckles to avoid contact with heat emitting parts. These parts are installed back to their original position.
4. After the repair, make sure to check if the screws, parts or cables are properly installed. Make sure no damage is caused to the repaired part and its surroundings.
5. Check for insulation between the blade of the AC plug and that of any conductive materials (i.e. the metal panel, input terminal, earphone jack, etc).
6. Insulation Check Process: Unplug the power cord from the AC source and turn the switch on. Connect the insulating resistance meter (500v) to the AC plug blade.
7. Any B+ interlock should not be damaged.
If the metal heat sink is not properly installed, no connection to the AC power should be made.
8. Make sure the grounding lead of the tester is connected to the chassis ground before connecting to the positive lead. The ground lead of the tester should be removed last.
9. Beware of risks of any current leakage coming into contact with the high-capacity capacitor.
10. The sharp edges of the metal material may cause physical damage, so ensure wearing protective gloves during the repair.
11. Due to the nature of plasma display panels, partial after-images may appear if a still picture is displayed on the screen for a long period of time.
This is caused by brightness deterioration due to the storage effect of the panel, and to prevent this from happening, we recommend that the brightness and contrast are reduced.
(e.g.) Contrast: 25, Brightness: 50

The insulating resistance between the blade of the AC plug and that of the conductive material should be more than 1 MΩ.

1-3 Static Electricity Precautions

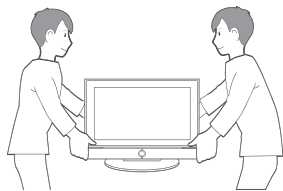
1. Some semi-conductive ("solid state") devices are vulnerable to static electricity. These devices are known as ESD. ESD includes the integrated circuit and the field effect transistor. To avoid any materials damage from electrostatic shock, follow the instructions described below.
2. Remove any static electricity from your body by connecting the earth ground before handling any semi-conductive parts or ass'ys. Alternatively, wear a dischargeable wrist-belt.
(Make sure to remove any static electricity before connecting the power source - this is a safety instruction for avoiding electric shock)
3. Remove the ESD ass'y and place it on a conductive surface such as aluminum foil to prevent accumulating static electricity.
4. Do not use any Freon-based chemicals.
Such chemicals will generate static electricity that causes damage to the ESD.
5. Use only grounded-tip irons for soldering purposes.
6. Use only anti-static solder removal devices.
Most solder removal devices do not support an anti-static feature. A solder removal device without an anti-static feature can store enough static electricity to cause damage to the ESD.
7. Do not remove the ESD from the protective box until the replacement is ready. Most ESD replacements are covered with lead, which will cause a short to the entire unit due to the conductive foam, aluminum foil or other conductive materials.
8. Remove the protective material from the ESD replacement lead immediately after connecting it to the chassis or circuit ass'y.
9. Take extreme caution in handling any uncovered ESD replacements. Actions such as brushing clothes or lifting your leg from the carpet floor can generate enough static electricity to damage the ESD.

CAUTION

These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

1-4 Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.



2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the high-voltage cable or the antenna falling over may cause fire or electric shock.
7. When connecting the RF antenna, check for a DTV receiving system and install a separate DTV reception antenna for areas with no DTV signal.
8. When installing the product, leave enough space (4") between the product and the wall for ventilation purposes.
A rise in temperature within the product may cause fire.
9. When moving a PDP with removable speakers, detach the speakers first before moving the main body. Moving the PDP main body without separating the speakers may cause the speakers to detach, possibly causing damage or injury.

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2. Product Specification

2-1 Product Features

Block	Specification	Major IC	Remark
PDP Module	SDI 42"SD/HD, 50"HD → Brightness1100 cd/m2, contrast 5000:1, 68719.47 million color(12bit)	42"	
Power	Input Voltage : AC 100V ~ 240V		
Video	3D Comb Video Decoder TMDS	PW3300	
	Scaler Deinterlacer	PW318	
	ADC	PW2250	
Sound	System : Stereo Output : 10W + 10W Speaker : External	MSP3425G, TA2024	
Cabinet	M5 (Front Cabinet : P3, Rear Cabinet : P5)		
Remocon	Normal : TM75B		
etc	- Development Level : Level 4 - Proto-Type Model : PPM50M5HB		

Picture

- System : Video → NTSC/PAL/SECAM, Sound → Stereo/Pseudo Stereo
- Progressive
- OSD : Smart user Interface Grade 1
- Picture Enhancement : Pseudo DNle (Pixelworks Image Enhance)
- Still picture, Zoom, Video wall(Full/Natural Mode)
- Comb Filter : 3D comb filter
- PIP : D/W, Large, Small
- Panorama

Feature

- Pivot : Automatic Fan On → 42"SD Normal/Pivot Exclusive Model, 42"HD/50"HD/63"HD, Normal/Pivot Commonness Model
- Video Wall(Full Mode/Natural Mode)
- Zoom, Color Tone

Connectivity

- Rear : AV IN, S-VHS Input
- Monitor Out : Composite, L/R
- 1 Component Input : 480i, 576i, 480p, 576p, 720p(50/60), 1080i(50/60)
- 1 DVI Input : 480p, 576p, 720p(50/60), 1080i(50/60), VGA to XGA(75Hz)
- 1 PC Input(D-Sub 15pin) : VGA to UXGA(60Hz) → 42" SD SXGA(60Hz)
- 1 PC Output(D-Sub 15pin) : VGA to UXGA(60Hz) → 42" SD SXGA(60Hz)
- 1 BNC(R/G/B/H/V) Input : VGA to UXGA(60Hz) → 42" SD SXGA(60Hz)
- RS232C In/Out (D-Sub 9pin)
- Speaker OUT

Power Consumption

- Stand by : Less than 3W
- Max Power : 42SD : 330W, 42HD : 380W, 50HD : 420W, 63HD : 630W(TBD)

2-2 Key Features

Model	PPM42M5S/PPM42M5H/PPM50M5H/PPM63M5H
Dimensions	PPM42M5S/PPM42M5H - 1027 x 79 x 630.5 mm / 40.43 x 3.11 x 24.82 inches
	PPM50M5H - 1204.6 x 79 x 724 mm ; 47.43 x 3.11 x 28.5 inches
	PPM63M5H - 1503.4 x 89 x 893.8 mm ; 59.19 x 3.5 x 35.19 inches
Weight	PPM42M5S/PPM42M5H - 31kg
	PPM50M5H - 43kg
	PPM63M5H - 69kg
Voltage	U.S.A/Canada - AC120V~, 60Hz
	Other countries - AC100-250V~, 50/60Hz
Power Consumption	PPM42M5S - 330W
	PPM42M5H - 380W
	PPM50M5H - 420W
	PPM63M5H - 630W
Number of Pixels	PPM42M5S - 852 (H) x 480 (V)
	PPM42M5H - 1024 (H) x 768 (V)
	PPM50M5H/ PPM63M5H - 1366 (H) x 768 (V)
Screen Size	PPM42M5S/PPM42M5H - 42 inches
	PPM50M5H - 50 inches
	PPM63M5H - 63 inches
Screen aspect ratio	16 : 9
Sound	Stereo
Audio output power	10W + 10W (8Ω)
VIDEO input	VIDEO IN - VIDEO/S-VIDEO COMPONENT1 - Y/Pb/Pr IN (RCA, 3P, 480i~1080i) RGB1(PC1) IN - D-SUB, 15P RGB2(PC2) IN - (BNC, 480i~1080i , VGA~XGA (R/G/B/H/V)) DVI IN - DVI-D type
AUDIO input	VIDEO IN - L/R COMPONENT1 IN - L/R (RCA,2P) AUDIO (Stereo jack for RGB1/2(PC1/2) and DVI input, 2 x mini jack)
Monitor Output	VIDEO OUT - VIDEO L/R (RCA,3P)
Audio Output	EXT SPEAKER (8Ω) – R+/- , L+/-

2-2-1 Hardware

- Major IC - Scaler : PW318B
 - Video Decoder/3D Comb/TMDS : PW3300
 - ADC : PW2250
 - Sound Processor : MSP3425G
 - Sound Amp : TA2024
 - Panel : V4_42SD → 16:9 (852 x 480)
 - V4_42HD → 16:9 (1024 x 768)
 - V4_50HD → 16:9 (1366 x 768)
 - V4_63HD → 16:9 (1366 x 768)
- Major Technical - 10bit Process (PW3300 / PW318B)
 - Double Window / PIP
 - Decoder Over sampling
 - Multi Tuner (Option)












2-2-2 Software

- MCU Scaler S/W
- Full-screen, Bitmap OSD, 256 colors, multiple pane.
- PIP, Double window, Dual Scaler
- 2-Wire master, slave I2C
- Pseudo Stereo

2-3 Specifications Analysis

Items	Sub-items	PPM42M5S	PPM42M5H	PPM50M5HB	PPM63M5H
Design					
General	Diagonal Size	42"	42"	50"	63"
Display	Aspect Ratio	16:09	16:09	16:09	16:09
	Native Resolution	852 x 480	1,024 x 768	1,366 x 768	1,366 x 768
	Pixel Pitch	T.B.D	T.B.D	T.B.D	T.B.D
	Brightness	1,100cd/m2	1,100cd/m2	1,100cd/m2	T.B.D
	Contrast	10,000:1	10,000:1	5,000:1	T.B.D
	Number of Colors	T.B.D	T.B.D	T.B.D	T.B.D
Input Terminals	Composite Video	1 x RCA			
	S-Video	1 x Din-4pin			
	Component	3 x RCA (Y/Pb/Pr)			
	RGB 1 (PC 1)	1 x D-sub 15pin			
	RGB 2 (PC 2)	5 x BNC (RGB HV)			
	DVI	1 x 29pin DVI			
	RS-232C	1 x D-sub 9pin			
	Audio	2 x mini jack, 2 sets RCA (L/R)			
Out put Terminals	Composite Video	1 x RCA			
	RGB 1 (PC 1)	1 x D-sub 15pin			
	RS-232C	1 x D-sub 9pin			
	Audio	2 x RCA (L/R)			
	Speaker	External Speaker Jack x 2			
Pictures	Scan System	Progressive Scan			
	Color system	Multi(PAL / SECAM / NTSC3.58 / NTSC4.43)			
	Digital Comb Filter	3D Comb filter			
	Color Temperature	Normal/Cool1/Cool2/Warm1/Warm2			
	Picture Mode	Custom, Dynamics, Standard, Movie (PC : Entertain/Internet/Text/Custom)			
	Screen Mode	Wide, Zoom1, Zoom2, 14:9, Normal, Panorama			
	Color Tone	Custom/Cool/Normal/Warm			
	Multi Display Mode	Natural Mode, Full Mode			
Sound	Stereo Type	Stereo			
	Sound Mode	Custom, Standard, Music, Movie, Speech			
	Speaker Type	Data cable			
	Sound output (RMS)	10W x 2			
Special Features	Feature 1	Burn-in Protection (Auto Pixel Shift, Signal Pattern Processor, All White)			
	Feature 2	Multi Display Screen			
	Feature 3	Picture in Picture, Picture by Picture			
	Feature 4	Digital Power Management Signaling System			
	Feature 5	Digital Zoom, Picture Freeze			
	Feature 6	Key Lock, IR Lock			
	Feature 7	Matrix Video Wall (2x2, 3x3, 4x4, 1x5, 5x1)			
	Feature 8	Programable Timer Function, On/Off Timer, Auto Power Off			
	Feature 9	Vertical Display Available			
	Feature 10	Auto Volume, Pseudo Stereo			
	Feature 11	VESA Wall Mount Standard Support			
Regulations		CE, UL1492, UL6500, CSA C22.2, FCC Class A			
Operating Conditions	Temperature	0 ~ 40 oC			
	Humidity	20 ~ 80 %			
	Altitude	700 ~ 1,114 hps			
Supplied Accessories	Accessory 1	Tabletop Stand, Remote control (Batteries included), Power Cord			
	Accessory 2	MDC CD, PC Cable, Owner's Instruction			
	Power Supply	100 ~ 240V (50/60Hz)			
	Power Consumption	330W (TBD)	380W (TBD)	420W (TBD)	630W (TBD)
Physical Specification	Dimensions (W x H x D)	1027x 630.5 x 96.5 mm	1027x 630.5 x 96.5 mm	1205x 724 x 96.5 mm	1504x 894 x 96.5 mm
	Weight	31kg	31kg	43kg	70kg

2-4 Accessories

Accessories		Item	Item code	Remark
Supplied Accessories		User Manual	BN68-00848B	Samsung Service center
		Remote Control AAA Batteries	BN59-00474A 4301-000103	
		Power Cord	3903-000085	
		PC Cable	BN39-00115A	
		Ferrite Core	3301-001201	
		MDC CD	BN59-00479A	
Accessories that can be purchased additionally		S-VIDEO Cable	-	Internal shopping mall
		HDMI/DVI cable	-	
		Component Cables (RCA)	-	
		PC Audio Cable	-	
		RS 232c cable	-	

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3. Alignment & Adjustment

3-1 Service Instruction

* Check items listed after changing each

1. Digital Board replace : White Balance adjustment
2. A/V Board replace : White Balance adjustment
3. Main SMPS Board replace: Vs, Va Voltage check and adjust
4. DC-DC SMPS Board replace : Output voltage check and adjust
5. Logic Board replace : Not adjustment
6. Y-Main Board replace : Not adjustment
7. X-Main Board replace : Not adjustment
8. Buffer Board replace : Not adjustment

3-2 How to Access Service Mode

3-2-1 To Enter into Factory Mode

1. General Remote Control

Entry : Display → Menu → Mute → Power key, Mute 1-8-2 → Power key
(Press each key at intervals of within 3 seconds.)

TL945 → PW318 Command.

Exit : Turn the power off and then turn it on.

2. Factory Control

Entry : DISPLAY KEY → FACTORY KEY(Press each key at intervals of within 3 seconds.)
AutoRemocon KEY (Line DV) - Required to be checked.

Exit : POWER OFF → ON, FACTORY KEY

Press the FACTORY key twice at intervals of over a second. (Pressing it once to enter into AGING mode)

Aging mode is required when performing in Line - Required to be checked.

3. Setting value required when entering into the Factory mode

- Sharp screen (Dynamic), Color Tone = Normal

4. Buttons operations within Service Mode

MENU	Full Menu Display / Move to Parent Menu
Direction keys ▲ / ▼	Item Selection by Moving the Cursor
Direction keys ◀ / ▶	Data Increase/Decrease for the Selected Item
Source	Cycles through the active input source that are connected to the unit

- Switch to the AV mode by using the TV/VIDEO key.

3-2-2 Initial Menu

- | | |
|------------------|------------------------|
| 1. White Balance | : White balance |
| 2. PW318 | : SCALER |
| 3. PW3300 | : DECODER ADC(AV,COMP) |
| 4. PW2250 | : ADC(PC) |
| 5. Logic | : PDP MODULE |
| 6. Option | : OPTION |
| 7. CheckSum | : 0000 |
| 8. Reset | : Factory reset |

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Version : T_PSC42MWW-1003

3-3 Factory Data

1. White Balance

No	Factory Name	VIDEO (S-VIDEO)	COMPONENT (480p/720p/1080i)	PC	DVI	OSD Range	Remark
1	Sub Contrast	197	169	194	184	0~255	
2	Sub Bright	100	82	78	87	0~255	
3	R Drive	105	117	117	117	0~255	
4	G Drive	128	128	128	128		
5	B Drive	129	139	135	135		
6	R Cutoff	140	141	137	136	0~255	Changed by 0x02 for each step.
7	G Cutoff	128	128	128	128		
8	B Cutoff	156	149	146	148		

2. PW318 : PICTURE ENHANCER

No	Factory Name	AV	Comp	Register	OSD Range	Reg Range	Remark
1	DI_Noise_Level	0	0	0x2E0/0x08[9:0]	0~1023		Noise Level. Average noise reduction filter threshold.
2	DI_NR_LPF_En	1	1	0x2E0/0x0A[0]	0,1		Noise Reduction Low pass filter enable.
3	DI_MD_LPF_En	1	1	0x2E0/0x0A[6]	0,1		Motion Detection Low pass filter enable.
4	DI_NR_En_Temporal	1	0	0x2E0/0x0B[0]	0,1		Temporal Noise Reduction enable
5	DP_DCS_En	0	0	0x690/0x1A[2]	0,1		Interpolation Only Mode. Setting this register causes the deinterlacer to interpolate on every field.
6	DP_DCS_Thresh	15	15	0x690/0x1E[8:0]	0~511		Vertical Linear interpolation. Setting this bit disables Low-Angle Interpolation(LAI)
7	DP_DCS_Gain	15	15	0x690/0x20[7:0]	0~255		Motion Weighting Factor.

3. PW3300(New) Video → Main

No	Factory Name	AV	COMP	Register	OSD Range	Reg Range	Remark
1	BRIGHTNESS	15	0	211[6:0]	0~50	0~0x64 Changed by 0x02 for each step	cvbs,s-video,comp
2	CONTRAST	256	256	213[8:0]	0~100	0x9C~0x164 Changed by 0x02 for each step	cvbs,s-video,comp
3	R GAIN	128	70	606[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
4	G GAIN	128	88	607[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
5	B GAIN	128	74	608[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
6	R OFFSET	128	135	609[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
7	G OFFSET	128	111	60A[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
8	B OFFSET	128	133	60B[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	Adjustment is available only in COMP
9	SATURATION	4176	4176	630[15:0]	0~8191	0x1C~0xE4 Changed by 0x02 for each step	
10	DLTIGAIN	0	0	700[3:0]	0~15	1000~1FFF	
11	DLTIFREQ	0	0	700[5:4]	0~03	0~0x0F	
12	PEAKGAIN	0	0	702[3:0]	0~15	0~0x03	
13	PEAKTHRES	0	144	703[7:0]	0~255	0~0x0F	
14	SHARPNESS	0	0	706[2:0]	0~7	0~0xFF	
15	AUTO COLOR	off	off	-	ON/OFF	0~0x07	When selecting ON, the auto color function is executed.

4. PW2250

No	Factory Name	PC	Register	OSD Range	Reg Range	Remark
1	BRIGHTNESS	0	211[6:0]	0~50	0~0x64 Changed by 0x02 for each step	
2	CONTRAST	256	213[8:0]	0~100	0x9C~0x164 Changed by 0x02 for each step	
3	R GAIN	107	606[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
4	G GAIN	104	607[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
5	B GAIN	104	608[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
6	R OFFSET	115	609[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
7	G OFFSET	115	60A[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
8	B OFFSET	120	60B[7:0]	0~100	0x1C~0xE4 Changed by 0x02 for each step	
9	AUTO COLOR	off	-	ON/OFF	-	When selecting ON, the auto color function is executed.

5. LOGIC : PDP DRIVER (Slave Address : 0X66)

No	Factory Name	Initial Value	Register	Reg.initial setting	Range	Remark
1	R GAIN	125	95h[15:8]	7d80	0-255	A GAIN adjustment of RED (for NORMAL)
2	G GAIN	128	95h[7:0]	7d80	0-255	A GAIN adjustment of GRN (for NORMAL)
3	B GAIN	114	96h[15:8]	7200	0-255	A GAIN adjustment of BLU (for NORMAL)
4	R OFFSET	128	89h[7:0]	80	0-255	A GAIN adjustment of RED (for NORMAL)
5	G OFFSET	128	8Ah[7:0]	80	0-255	A GAIN adjustment of GRN (for NORMAL)
6	B OFFSET	128	8Bh[7:0]	80	0-255	A GAIN adjustment of BLU (for NORMAL)
7	INPUT BIT	10 Bit	42SD: 26h[1:0]		8/10/12BIT	Select internal or external input data. 0:8bit(10,11)/1:10bit(01)/2:12bit(00) Input Data Mux
			42HD: 26h[2:0]		8/10/12BIT	0:8bit(0x000)/1:10bit(0x010)/2:12bit(100~111) DATA MODE ('0'=256, '1'=512, '2'=1024, '3'=2048, else 4096)
8	PAT SEL	0	80h[13:8]		0 - 0x18	When 24, select an internal pattern of the Logic Board from off (normal screen) 1.
9	ERD SW	Off	97h[9]	1d00	ON/OFF	ERD SW
10	Dither SW	Off	98h[13]	0	ON/OFF	BRI-DITHER operation switch
11	GAM SW	Off	8Ch[8]	100	ON/OFF	GAMMA FUNCTION ON/OFF ['1' : ON, '0' : OFF]
12	GTS SW	Off	8Ch[0]	100	ON/OFF	GTS(GAMMA) FUNCTION ON/OFF ['1' : ON, '0' : OFF]
13	GAM_SEL	0	90h[2:0]	0	0~4	R_GAM_SEL

6. OPTION Byte

No	Factory Name	Initial Value	Register	Range	Remark
1	PC Frame Lock	Off	PW318B	On/Off	ON: FRAME LOCK when vertical frequency is 60 Hz for each input resolution in PC mode OFF: Off in all conditions
2	Serial Mode	MDC	Program	Debugger/HDCP/MDC	When downloading the program to the EEPROM for the first time, set it to HDCP and then → set it to MDC after a FACTORY RESET.
3	Sound Delay	On	-	ON/OFF	When it is ON, it operates in NORMAL mode. When it is OFF, it operates in PC ONLY mode (including the UI and function operations)
4	AV Board	Default	PW2250 0x805[15:13]	Default, 1,2,3	Refer to the following descriptions.
5	DDC WP	DISABLE	PW3300 GPIO13	DISABLE/PROTECT	When downloading the program to the EEPROM for the first time, it is set to LOW (DISABLE) → it is set to HIGH (PROTECT) after a FACTORY RESET. In FACTORY, it can be toggled. For more information refer to the following. Refer to the following descriptions.
6	PixelShift Test	Off	Program	On/Off	ON → 3 Speed
7	Aging mode	Off	Program	On	ON → Aging mode When there is no Factory remote control, AGING MODE is available. Refer to the following descriptions.

* DDC WP: PW3300 GPIO13(B6 PIN)

OSD	Fixing	Remark
ENABLE	When downloading the program to the EEPROM for the first time, it is set to LOW (DISABLE).	FACTORY MODE TOGGLE
PROTECT	A FACTORY RESET sets it to HIGH (PROTECT MODE).	

* Sound delay PW2250 reg: 0x805h: bit15,bit14,bit13

OSD	bit5 delay2	bit15 delay1	bit13 default	Remark
default	0	0	0	default
1	0	0	1	dealy1
2	0	1	1	delay2
3	1	1	1	delay3

* Aging Mode

- ① Entry : DISPLAY key → FACTORY key (Entered into FACTORY mode)
 - FACTORY key (Enter into Aging mode) or Set the Aging mode On in the above option.
 - In the Aging mode, R, G, B, and Full White pattern are displayed in turn at intervals of five seconds.
(Please implement R-G-B-F/W pattern in Scaler.)
 - Mute the sound.
- ② Exit
 - LOCAL key → Exits the Aging mode and enters into KEY MATRIX (Panel key)
 - The Aging mode will continue even if you turn the MASTER S/W off and turn it on, unless you complete the two above procedures.

7. CheckSum

The checksum of the current version is displayed when it is launched.

8. Reset mode

Factory Reset

- ① Facory Menu → Reset
- ② Initialize data (User Control Data) except for the data adjusted in the Factory mode, and turn the power off (Standby mode).

3-4 Service Adjustment

3-4-1 White Balance Adjustment

1. W/B Adjustment is required for the following two modes :Component→PC
(Signal equipment : MSPG-925LTH, Measurement equipment : CA210)
2. Adjustment Method
Adjust the target set by using the control register of the Logic and Video board of the panel and so as to set the standard of W/B of the panel based on the DVI input, a fully digital path.

- White Balance Coordinates by Mode

		COMPONENT	PC
H/L (High Light)	x	280	280
	y	295	295
	Y(fL)	31	31
L/L Low Light	x	280	280
	y	295	295
	Y(fL)	0.8	0.8

1. Pattern Generator Device: 925 LTH (Manufacturer: Master)
2. Adjust Pattern : ABL Pattern(Master 925LTH #16 Pattern)
3. Adjust Timing : Component - 720P(Master 925LTH Model # 6)
PC - 1024*768 60Hz
4. The adjustment procedures for each mode are described as follows:

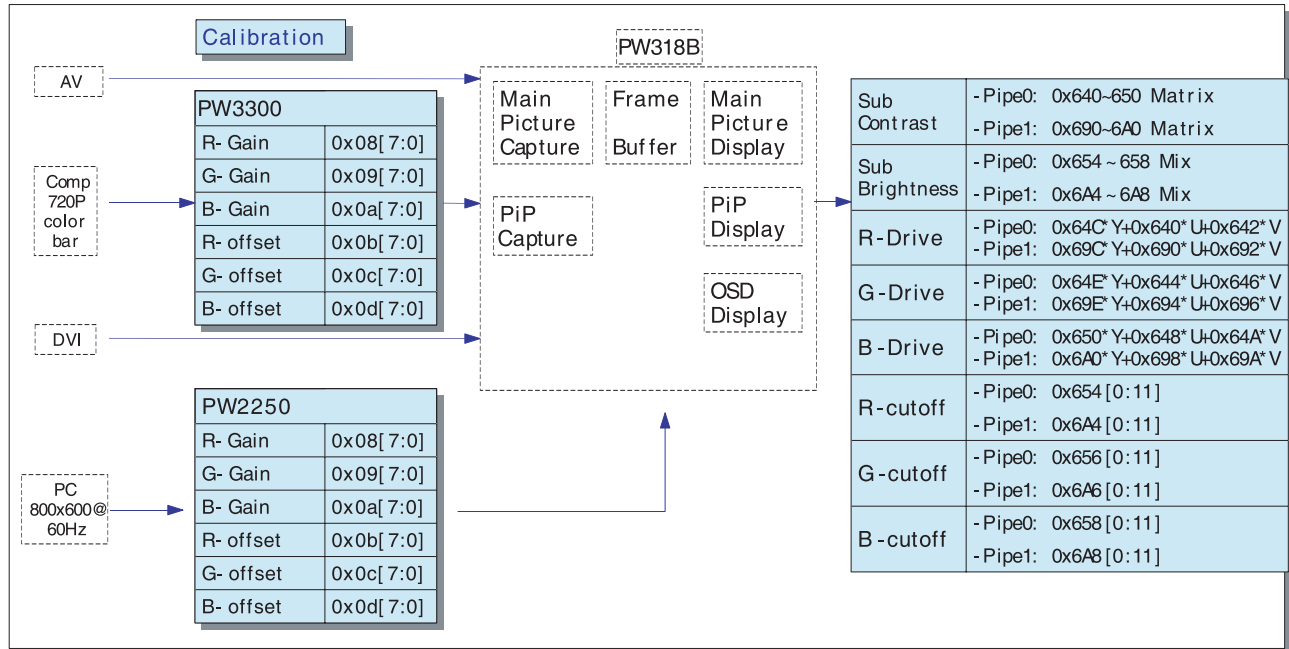
1) Component

- ① You need to run Auto Color before adjusting W/B.
Apply the 720p (#6) color bar pattern (#15), run factory pw3300 15.auto color and then adjust W/B.
- ② Send the Toshiba ABL Pattern (Pattern #16) of the 720p (Model #6) resolution signal to the Component IN port using the Master 925 LTH.
- ③ Enter Factory mode, move to "White Balance" and click Select.
- ④ Set the coordinates of H/L and L/L by adjusting "Sub Contrast", "Sub Bright", "R Drive", "G Drive", "B Drive", "R Cutoff", "G Cutoff", and "B Cutoff".

2) PC

- ① You need to run Auto Color before adjusting W/B.
Apply the 800x600@60Hz(#16) color bar pattern (#15), run factory pw3300 15.auto color and then adjust W/B.
- ② Send the Toshiba ABL Pattern (Pattern #16) of the 1024x 768 60Hz (Model #21) resolution signal to the PC IN port using the Master 925 LTH.
- ③ Enter Factory mode, move to "White Balance" and click Select.
- ④ Set the coordinates of H/L and L/L by adjusting "Sub Contrast", "Sub Bright", "R Drive", "G Drive", "B Drive", "R Cutoff", "G Cutoff", and "B Cutoff".

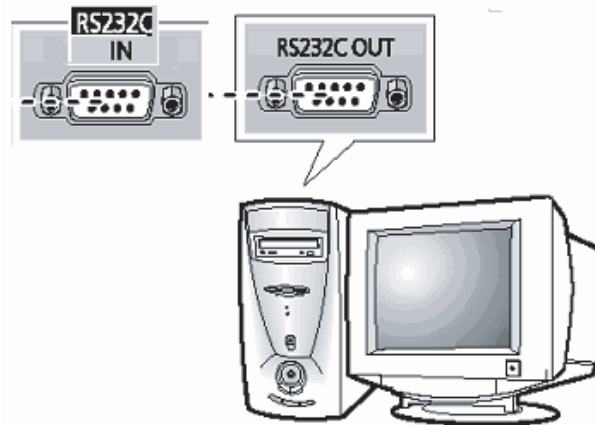
※ White Balance Fine Tune Block



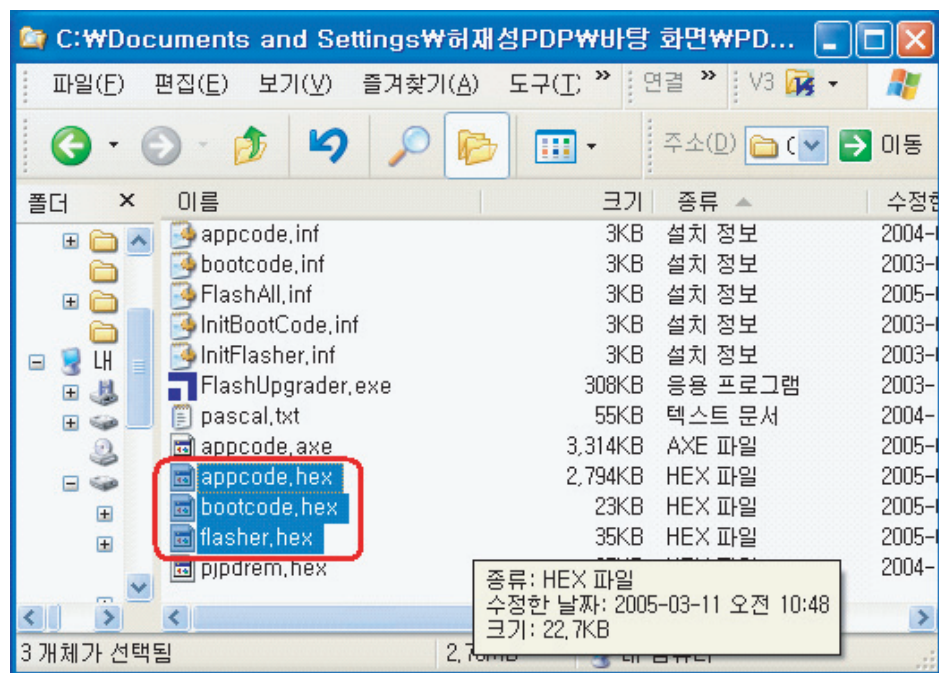
3-5 Software Upgrade

3-5-1 How to Download the PDP Monitor Program

1. Disconnect the power cord of PDP.
2. Connect the RS232C OUT terminal of your PC to the RS232C IN terminal of your PDP using the RS232C CABLE.



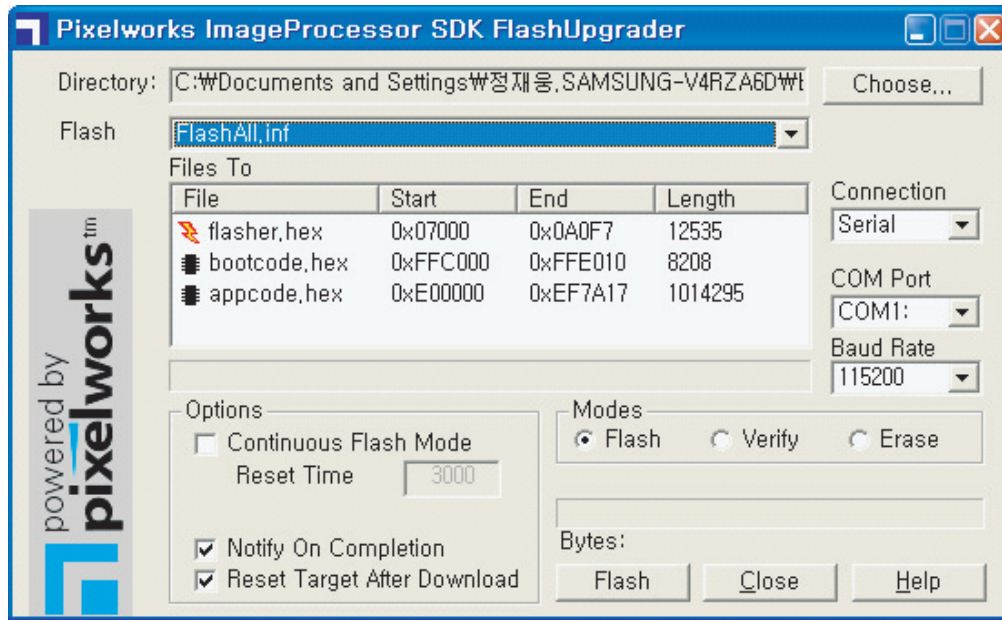
3. Copy 3files(appcode.hex, bootcode.hex, flasher.hex) and put them in the program folder.



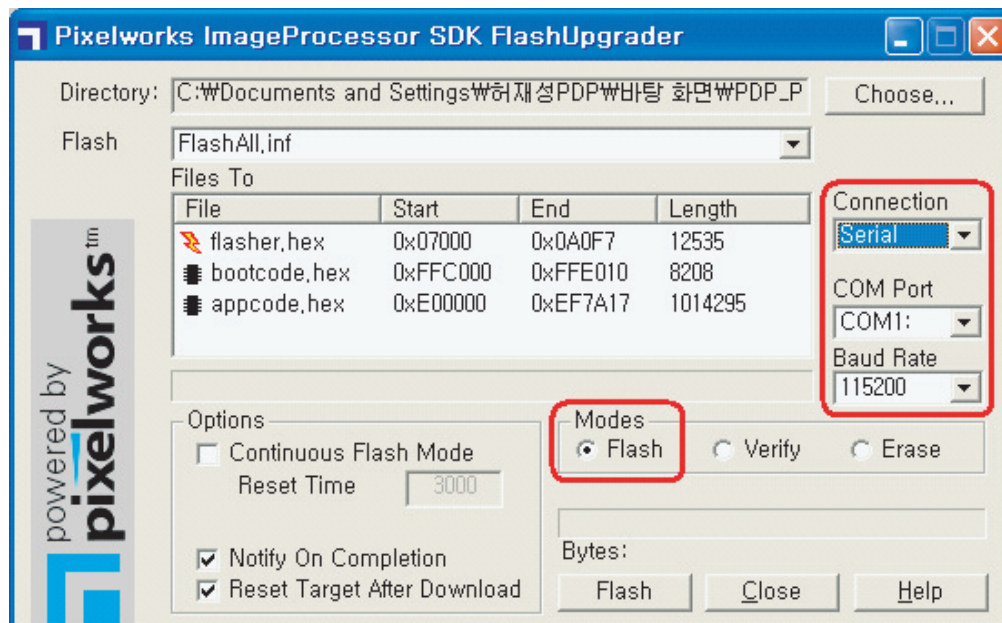
4. Run the download program.



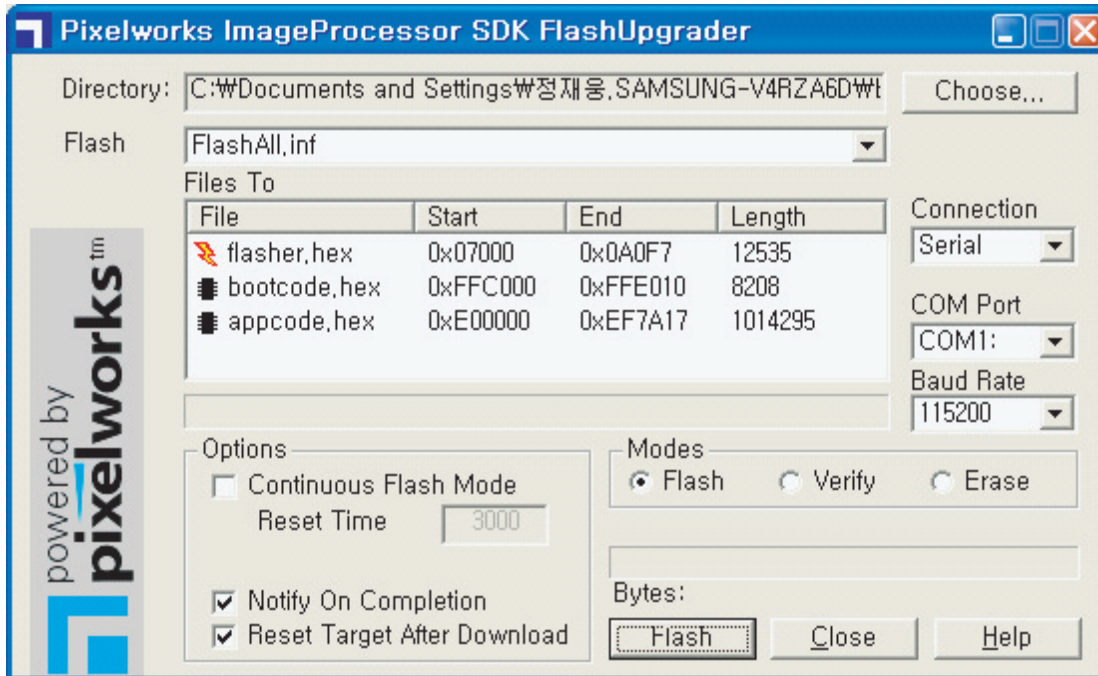
5. Click Flash column and select FlashAll.inf



6. Check 'Connection' and 'Modes' at the following screen.



7. Click Flash to start the upgrade.

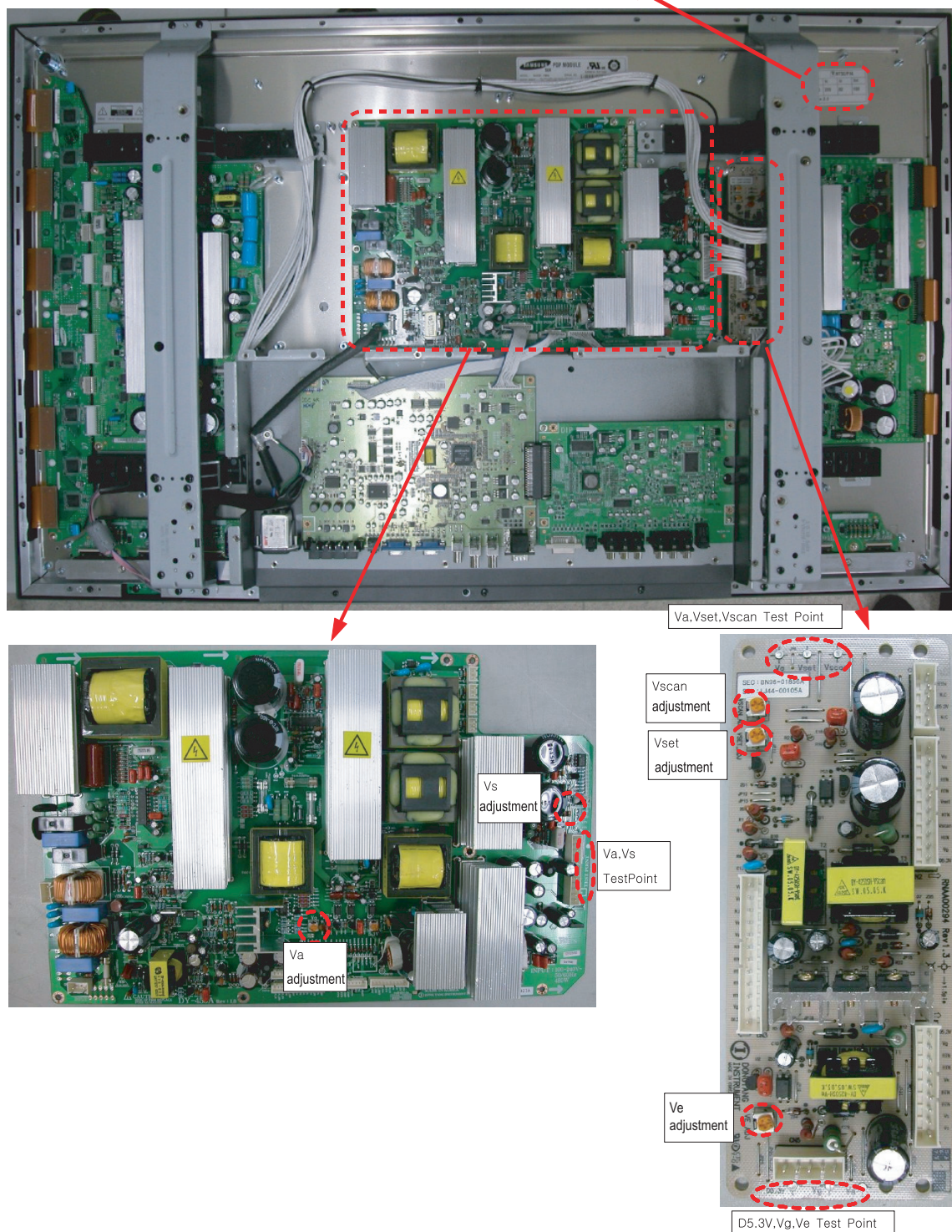


8. Connect the power cord of PDP then program upgrade run automatically.
9. When the program upgrade is complete, then PDP will turn on automatically.

3-6 Replacements & Calibration

3-6-1 SMPS Voltage Adjustment

※ When replacing SMPS or PDP panel, check the voltage printed on the **panel sticker**, and adjust it, if necessary.

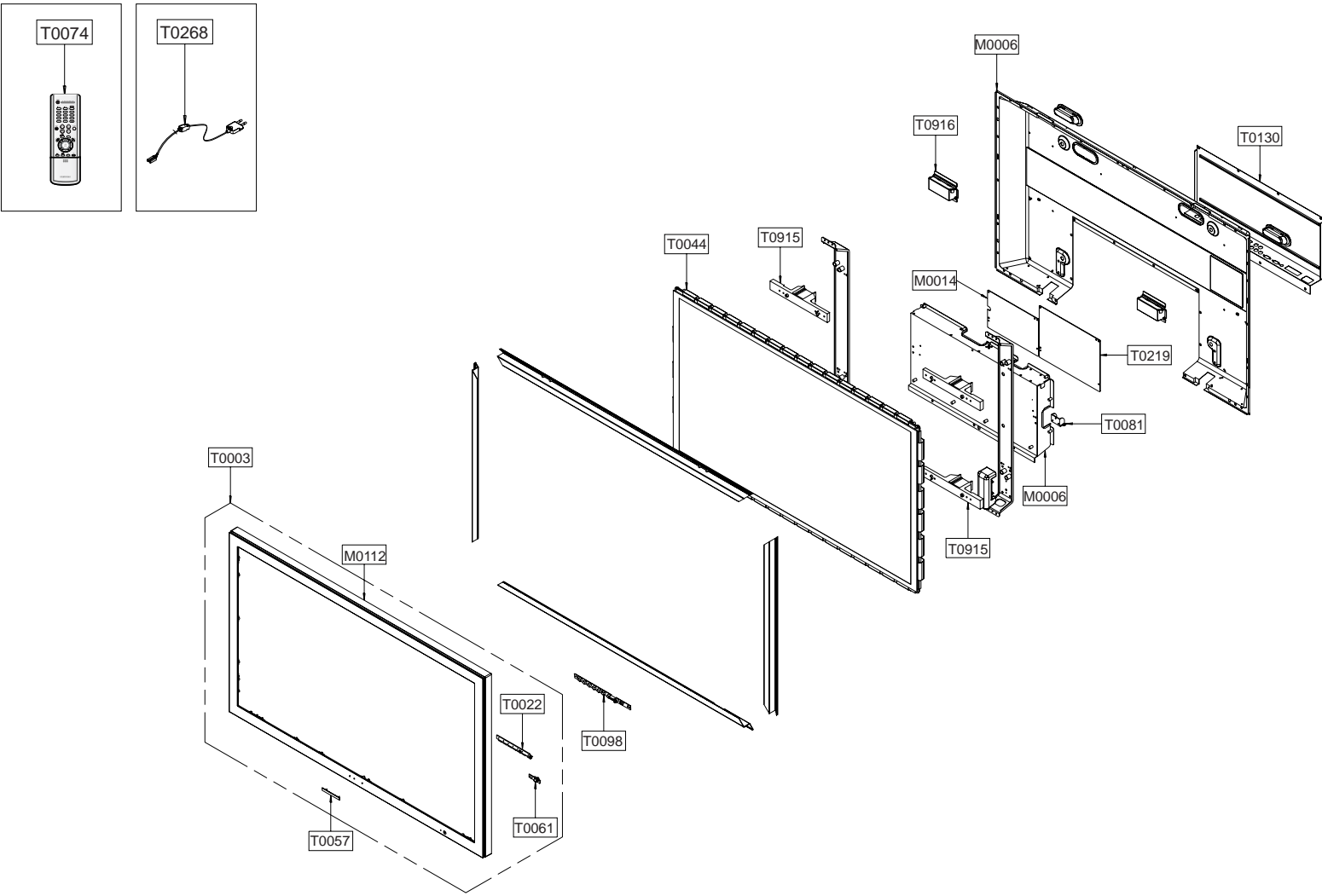


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4. Exploded View & Part List

4-1 PPM42M5SSX/XAX

You can search for the updated part code through ITSELF web site.
URL:<http://itself.sec.samsung.co.kr>



Loc.No.	Code No.	Description	Specification	Q'ty	SA/SNA	Remark
M0006	BN63-01812A	COVER-REAR	42M5,SECC,T0.5	1	S.N.A	
M0006	BN63-01818A	COVER-REAR SUB	M5,SECC,T1.0	1	S.N.A	
M0014	BN94-00685A	ASSY PCB MISC-PC MAIN	PPM42M5S,D71B,Pasc	1	S.A	
M0112	BN63-01823A	COVER-FRONT	42M5,HIPS,T3.3,HB,GR-806P	1	S.N.A	
T0003	BN96-02105A	ASSY COVER P-FRONT	42M5,HIPS HB,GR806P	1	S.A	
T0022	BP64-00045F	KNOB CONTROL	42M5,ABS,HB,GR-806P	1	S.N.A	
T0044	BN96-01887A	ASSY PDP MODULE P	M1,PS42S5S,D,V4,1002 ₁ 2	1	S.A	
T0057	BP64-00177A	BADGE-BRAND	ALL,AL,T1.5,70,11.3,BLK,SILI	1	S.N.A	
T0061	BN64-00074B	WINDOW-REMOTE	42P3S,PMMA,,,,,CLEAR	1	S.A	
T0074	BN59-00474A	REMOCON	PASCAL,TM75B,160x58x21,ZILOG MBR	1	S.A	
T0081	BN61-00319A	BRACKET-POWER	50P3H,SECC,T1.5	1	S.N.A	
T0098	BN94-00696A	ASSY PCB MISC-CONTROL	PPM42M5S,D71B,Pasc	1	S.A	
T0130	BN96-02106A	ASSY COVER P-TERMINAL	PPM42M5,SECC T0.5	1	S.N.A	
T0219	BN94-00734A	ASSY PCB MISC-AV SUB	PPM42M5S-,D71B,PASC	1	S.A	
T0268	3903-000085	CBF-POWER CORD	DT,US,BP3/YES,I(IEC C13/C	1	S.A	
T0915	BN61-01491A	HOLDER-MODULE	SPD-42P5HD,PC ABS	2	S.N.A	
T0915	BN61-01491A	HOLDER-MODULE	SPD-42P5HD,PC ABS	2	S.N.A	
T0916	BN61-00755A	BRACKET-HANDLE	SPD-50P4,AL,T1.2	2	S.N.A	

5. Electrical Part List

5-1 PPM42M5SSX/XAX Service Item

You can search for the updated part code through ITSELF web site.

URL: <http://itself.sec.samsung.co.kr>

Loc.No.	Code No.	Description	Specification	Q'ty	SA/SNA
M0114	BN39-00115A	CBF SIGNAL	NL5MO,15P/15P,2990,1830MM,UL2	1	S.A
T0074	BN59-00474A	REMOCON	PASCAL,TM75B,160x58x21,ZILOG MBR	1	S.A
M0014	BN94-00685A	ASSY PCB MISC-PC MAIN	PPM42M5S,D71B,Pasc	1	S.A
T0098	BN94-00696A	ASSY PCB MISC-CONTROL	PPM42M5S,D71B,Pasc	1	S.A
T0159	BN96-01856A	ASSY PCB P-SMPS	SPD-50P5HD(DC_DC),200Vin	1	S.A
T0044	BN96-01887A	ASSY PDP MODULE P	M1,PS42S5S,D,V4,1002iç	1	S.A
T0159	BN96-01923A	ASSY PCB P-SMPS	PS-42S5S,100~240V	1	S.A
T0073	BN96-02038A	ASSY PDP P-X MAIN BOARD	M1,PS42S5S,D,V4,	1	S.A
T0096	BN96-02039A	ASSY PDP P-Y MAIN BOARD	M1,PS42S5S,D,V4,	1	S.A
T0048	BN96-02040A	ASSY PDP P-Y BUFF UPPER BOARD	M1,PS42S5S	1	S.A
T0049	BN96-02041A	ASSY PDP P-Y BUFF LOWER BOARD	M1,PS42S5S	1	S.A
T0142	BN96-02042A	ASSY PDP P-LOGIC BOARD	M1,PS42S5S,D,V4,1	1	S.A
T0937	BN96-02043A	ASSY PDP P-ADDRESS E BUFF BOAR	M1,PS42S5	1	S.A
T0938	BN96-02044A	ASSY PDP P-ADDRESS F BUFF BOAR	M1,PS42S5	1	S.A
M0013	BN96-02101A	ASSY COVER P-REAR	PPM42M5,SECC, T0.5	1	S.A
T0003	BN96-02105A	ASSY COVER P-FRONT	42M5,HIPS HB,GR806P	1	S.A
M0013	BN96-02367B	ASSY STAND P-BASE	42M5,PPS,BLK	1	S.A
M0018	BN97-00552A	ASSY MICOM	PPM42M5SS,D71B,29LV160,T-PSC4	1	S.A

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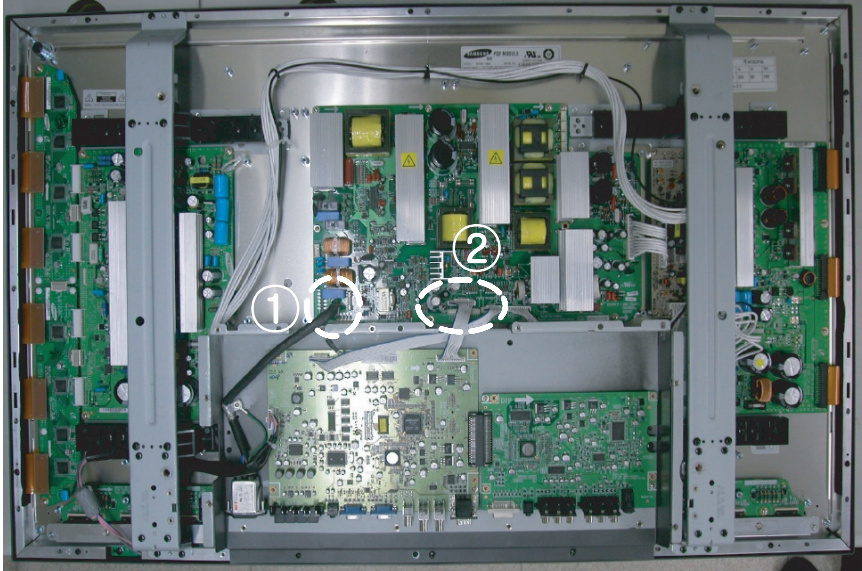
6. Troubleshooting

6-1 First Checklist for Troubleshooting

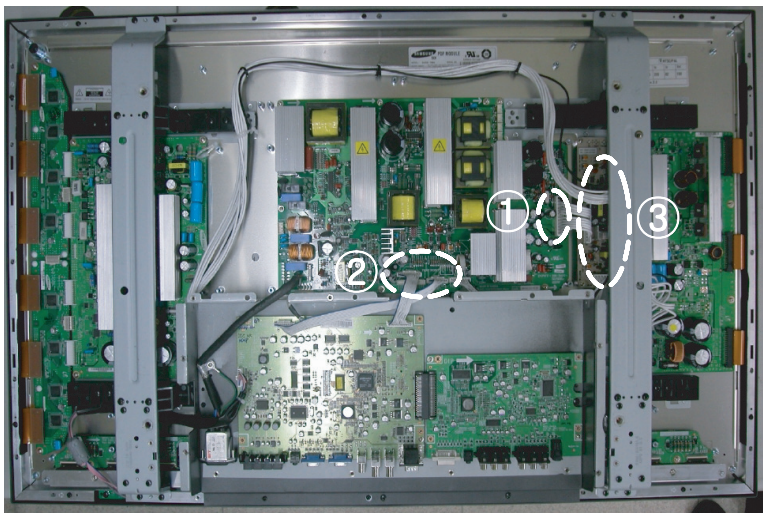
1. Check the various cable connections first.
 - Check to see if there is a burnt or damaged cable.
 - Check to see if there is a disconnected cable connection or a connection is too loose.
 - Check to see if the cables are connected according to the connection diagram.
2. Check the power input to the Main Board.
3. Check the voltage in and out between the SMPS ↔ Main Board, between the SMPS ↔ X, Y Drive Board, and between the Logic Boards.

6-2 Checkpoints by Error Mode

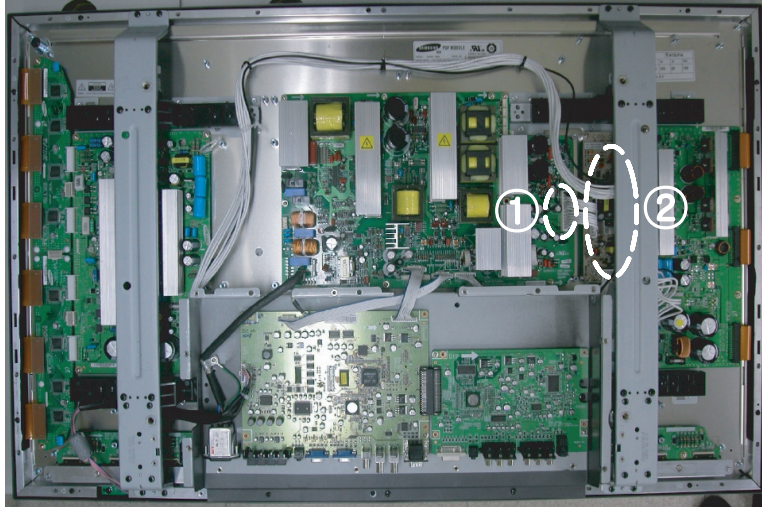
6-2-1 No Power

Symptom	<ul style="list-style-type: none"> - The LEDs on the front panel do not work when connecting the power cord. - The SMPS relay does not work when connecting the power cord. - The power of the unit seems to be out of order.
Major Checklist	<p>The SMPS relay or the LEDs on the front panel do not work when connecting the power cord if the cables are improperly connected or the Video Board or SMPS is out of order. In this case, check the following:</p> <ul style="list-style-type: none"> - Check the internal cable connection status inside the unit. - Check the fuses of each part. - Check the output voltage of SMPS. - Replace the Video Board.
Troubleshooting Procedures	 <pre> graph TD Q1_1[① Are the AC IN socket connector and the Main SMPS CN800 connected?] -- No --> A1_1[The AC IN socket connector and the Main SMPS CN800 connected] Q1_1 -- Yes --> Q1_2[① Is the Fuse (F801) of the Main SMPS Power Input Part blown?] Q1_2 -- No --> A1_2[Replace Fuse (F801)] Q1_2 -- Yes --> Q2_1[② Main SMPS CN804-1 Pin 10: STB 5V Pin 8 PS-ON: Check to see if it is 0V] Q2_1 -- No --> A2_1[Replace the Main SMPS] Q2_1 -- Yes --> Q3_1[Replace the Main Board] Q3_1 -- No --> A3_1[Replace the Digital Board] </pre>

6-2-2 When the unit is repeatedly turned on and off

Symptom	- The SMPS relay is repeatedly turned on and off.
Major Checklist	<p>In general, the SMPS relay repeatedly turns on and off by the protection function due to a defect on a board connected to the SMPS.</p> <ul style="list-style-type: none"> - Disconnect all cables from the SMPS, operate the SMPS alone and check if the SMPS works properly and if each voltage output is correct. - If the symptom continues even when SMPS is operated alone, replace the SMPS. - If the symptom is not observed when operating the SMPS alone, find any defective ASSYs by connecting the cables one by one.
Troubleshooting Procedures	 <pre> graph TD Q1["① Does the symptom continue after connecting the power and removing the CN800 cable from the Main SMPS?"] Q2["② Does the symptom continue after connecting the power and removing the CN800 cable from the Main SMPS?"] Q3a["③ Does the symptom continue when connecting the power after connecting the CN800 cable and removing the CN1, CN2, CN4 and CN6 cables from the DC-DC SMPS?"] Q3b["③ Does the symptom continue when connecting the power after removing the CN4 cable from the DC-DC SMPS?"] Q3c["③ Does the symptom continue when connecting the power after removing CN2 from the DC-DC SMPS?"] Q3d["② Does the symptom continue when connecting the power after removing CN810 from the Main SMPS?"] R1["Replace the Main SMPS"] R2["Replace the DC-DC SMPS"] R3a["Replace the X Drive Board"] R3b["Replace the Y Drive Board"] R3c["Replace the Logic Drive Board"] Q1 -- Yes --> R1 Q1 -- No --> Q3a Q2 -- Yes --> R1 Q2 -- No --> Q3a Q3a --> R2 Q3b --> R3a Q3c --> R3b Q3d --> R3c </pre>
Caution	When separating and connecting the cables such as CN800 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separating the power cord from the unit.

6-2-3 No Picture (When audio is normal)

Symptom	- Audio is normal but no picture is displayed on the screen.
Major Checklist	<ul style="list-style-type: none"> - This may happen when the Video Board is normal but the X, Y Drive Board, Logic Board, or Y Buffer Board is out of order. - The output voltage of the Main SMPS or the DC-DC SMPS is out of order. - This may happen when the LVDS cable connecting the Main Board and the Logic Board is disconnected.
Troubleshooting Procedures	 <pre> graph TD Q1["① Does the symptom continue after connecting the power and removing the CN800 cable from the Main SMPS?"] A1No["No"] A1Yes["Yes"] Q2["② Is the output voltage of the DC-DC SMPS normal when reconnecting the CN800 cable and removing the CN1, CN2, CN4 and CN6 cables from the DC-DC SMPS?"] A2No["No"] A2Yes["Yes"] R1["Replace the Main SMPS"] R2["Replace the DC-DC SMPS"] R3["Replace the Y Drive Board"] R4["Replace the X Drive Board"] R5["Replace the Logic Drive Board"] R6["Replace the Y Buffer Drive Board"] Q1 -- No --> R1 Q1 -- Yes --> Q2 Q2 -- No --> R2 Q2 -- Yes --> R3 R3 --> R4 R4 --> R5 R5 --> R6 </pre>
Caution	When separating and connecting the cables such as CN800 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of the DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separating the power cord from the unit.

6-3 Trouble-shooting with New Features

6-3-1 Installation & Connection

Problem	Solution
The unit does not turn on when I press the Power button on the remote control.	<ul style="list-style-type: none"> ■ Check to see if the power cord is connected. ■ Confirm that the Device Selection of the remote control is set to TV.
A normal broadcast is not displayed.	Check to see if the antenna cable has been properly connected. Aerial IN 1: Normal/Cable/DTV, Aerial IN 2: DTV only
Digital broadcast is not displayed.	<ul style="list-style-type: none"> ■ Check that the aerial for receiving digital broadcasts (UHF aerial) has been installed. When watching cable TV, check that your cable TV service provider transmits digital broadcasts. ■ Check to see if the aerial cable is properly connected. Aerial IN 1: Normal/Cable/DTV, Aerial IN 2: DTV only ■ Run Auto Scan.
Cable broadcasting does not work.	Install a satellite antenna (Parabola) and connect it to the TV.
Satellite broadcasting does not work.	Subscribe to a local cable broadcasting firm and get support.

6-3-2 Menu & Remote Control

Problem	Solution
The remote control does not work.	<ul style="list-style-type: none"> ■ Press the Select Device button to select the TV or external device. ■ Replace the battery of the remote control with a new one. ■ Insert the battery making sure the polarity (+,-) is correct. ■ Check if the angle or the distance is sufficient, or if there is any interference between the product and the remote control. ■ Make sure the user has pressed the correct button. ■ To avoid direct sunlight to the receiving panel of the TV, remove any indoor lighting or change the location of the TV. ■ Check if the power switch at the back left of the TV is turned on.
Cannot change the channel with the remote control.	<ul style="list-style-type: none"> ■ Press the Select Device button to select the TV. ■ Change the channel using the remote control of the cable or satellite receiver.
Cannot select an A/V channel.	Press the TV/AV button and check if the AV item is grayed out. When the AV item is grayed out, you cannot select an A/V channel. Check if the connector is properly connected.
Cannot select a menu.	Check if the menu is grayed out. If a menu is grayed out, it cannot be selected.

6-3-3 Screen

Problem	Solution
The screen is black and there is no sound.	<ul style="list-style-type: none"> ■ Check if the power cord is properly connected. ■ Turn on the power. ■ Select an AV channel that corresponds to the external device.
Only the screen is blank/it is dark or too bright.	<ul style="list-style-type: none"> ■ Adjust the screen brightness. ■ If the screen is too dark, check to see if Power Saving Mode is set to "Super Power Saving". Although Super Power Saving Mode consumes less power than Standard Mode, Super Power Saving Mode may have the screen dark.
The screen is blue/the external channel is not displayed.	<ul style="list-style-type: none"> ■ Check if the connector is properly installed. ■ Select an AV channel that corresponds to the external device.
The screen overlaps (double/triple).	<ul style="list-style-type: none"> ■ Check if the antenna is properly installed. ■ Adjust the position, angle or direction of the antenna.
The screen is snowy or unclear. The picture quality gets worse when it is windy	<ul style="list-style-type: none"> ■ Check if the antenna has been bent or moved by the wind. ■ Check the antenna for its lifetime. (Normally 3 - 5 years, 1-2 years near the coast)
Dotted or semi-dotted lines are displayed on the screen.	Install the antenna as far away from the road as possible.
The screen is black and white.	<ul style="list-style-type: none"> ■ Adjust the color density. ■ Check if the connector is properly installed.
The colors of the screen are odd/strange.	Adjust the color tones.
Unusual lines appear on the screen.	Keep the antenna away from the power cord or connectors if possible.
Unusual lines appear on the screen when watching or	Keep the video player as far away from the TV as possible.
There is no picture on the screen when I have connected to another device through the Monitor OUT port.	A video signal is only output through the Monitor OUT port when the current input mode is TV (analog broadcast), External In or S-VIDEO. Check that the current mode is one of the above.
Black or red spots appear on the screen.	A PDP TV uses a PDP panel consisting of 123million (SD Grade) ~ 315million (HD Grade) pixels. Although a PDP panel is a product that requires high technologies to integrate a few million pixels, a bright or dark pixel may exist on the panel, this does not affect the performance of the product.
A boundary appears on the screen.	<ul style="list-style-type: none"> ■ Displaying a still picture on the screen may permanently damage the PDP panel. ■ A boundary may appear due to the difference in the transparency of the panel when watching the picture in the 4:3 aspect ratio for a long time and the picture in the left, right and center screens is a still image. ■ A boundary may appear when watching a still picture from a DVD player or a video game console on the screen for a long time.
An after-image remains on the screen.	Due to the nature of PDP TVs, partial after-images may appear if a still picture is displayed for a certain period of time after connecting a video game console or a computer. This is caused by brightness deterioration due to the storage effect of the panel, and to prevent this from happening, we recommend you reduce 'brightness' and 'contrast'.

6-3-4 Sound

Problem	Solution
A "snapping" sound is emitted from the product.	This sound may be heard when the product chassis shrinks or expands due to the surrounding humidity or temperature change. This sound does not indicate a problem and there is no need to worry.
There is noise from the product.	A PDP TV may produce sound at a certain level when operating the fan to cool its internal temperature. In addition, since the high-speed switching circuit and the high current may produce noise depending on the screen brightness change, a PDP TV produces more noise than a conventional CRT TV.

6-3-5 PC

Problem	Solution
I cannot change the resolution.	Update the driver of the graphics card with the latest version.
Letters are not properly displayed.	Set the resolution lower than the current one. (e.g. $1024 \times 768 \rightarrow 640 \times 480$)

6-3-6 Others

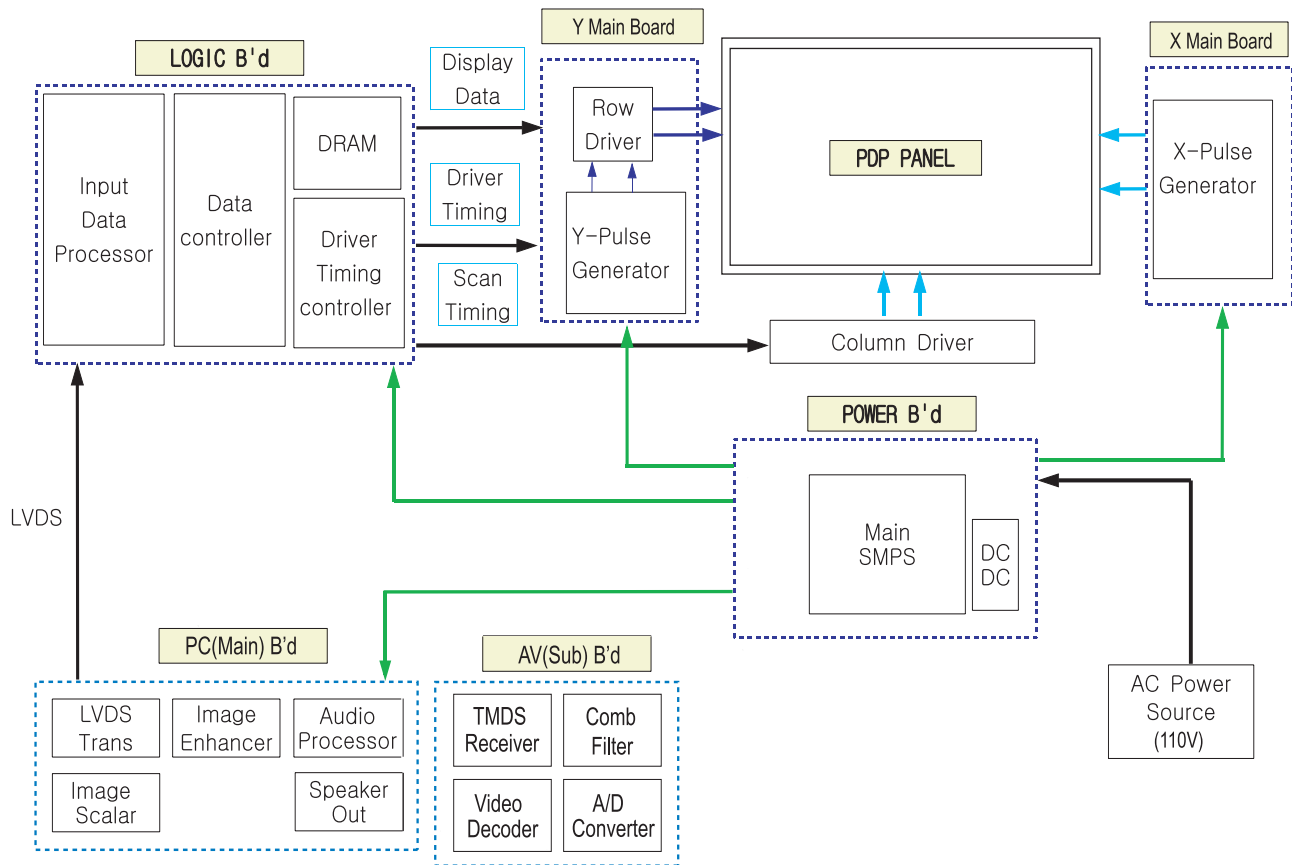
Problem	Solution
The product is hot.	Since a PDP TV displays a picture on the screen by discharging plasma, operating for a long time may introduce heat onto the panel. The internal heat of the panel is sent to the vent on the upper part of the product, and users must take care not to touch the hot air from the vent. The heat from the PDP TV does not indicate a defect or problem.

6-4 Troubleshooting Procedures by ASS'Y

No	Name	Code No	Description	Major Symptoms
1	ASSY PCB P-SMPS	BN96-01923A	Main SMPS	No power, Blank screen, the Relay repeats On and Off.
2	ASSY PCB P-SMPS	BN96-01856A	DC-DC SMPS	Blank screen, the Relay repeats On and Off.
3	ASSY PDP P-X MAIN BOARD	BN96-02038A	X MAIN BOARD	Blank screen
4	ASSY PDP P-Y MAIN BOARD	BN96-02039A	Y MAIN BOARD	Blank screen
5	ASSY PDP P-LOGIC BOARD	BN96-02042A	LOGIC BOARD	Blank screen, Screen noise
6	ASSY PDP P-Y BUFF UPPER BOARD	BN96-02040A	Y BUFF UPPER BOARD	Upper screen is blank
7	ASSY PDP P-Y BUFF LOWER BOARD	BN96-02041A	Y BUFF LOWER BOARD	Lower screen is blank
8	ASSY PDP P-ADDRESS E-BUFF BOARD	BN96-02043A	ADDRESS E-BUFF BOARD	Corresponding Buffer Board block screen is blank.
9	ASSY PDP P-ADDRESS F-BUFF BOARD	BN96-02044A	ADDRESS F-BUFF BOARD	Corresponding Buffer Board block screen is blank.
10	ASSY PCB MISC PC-MAIN	BN94-00685A	PC BOARD	No Power, Screen is blank, Screen is broken
11	ASSY PCB MISC AV-SUB	BN94-00734A	AV BOARD	DVI Input, SVideo, Component, AV In/Out
12	ASSY PCB MISC-CONTROL	BN94-00696A	Function Key Board	The remote control does not work properly, the LED does not work properly, function key mode does not work properly.

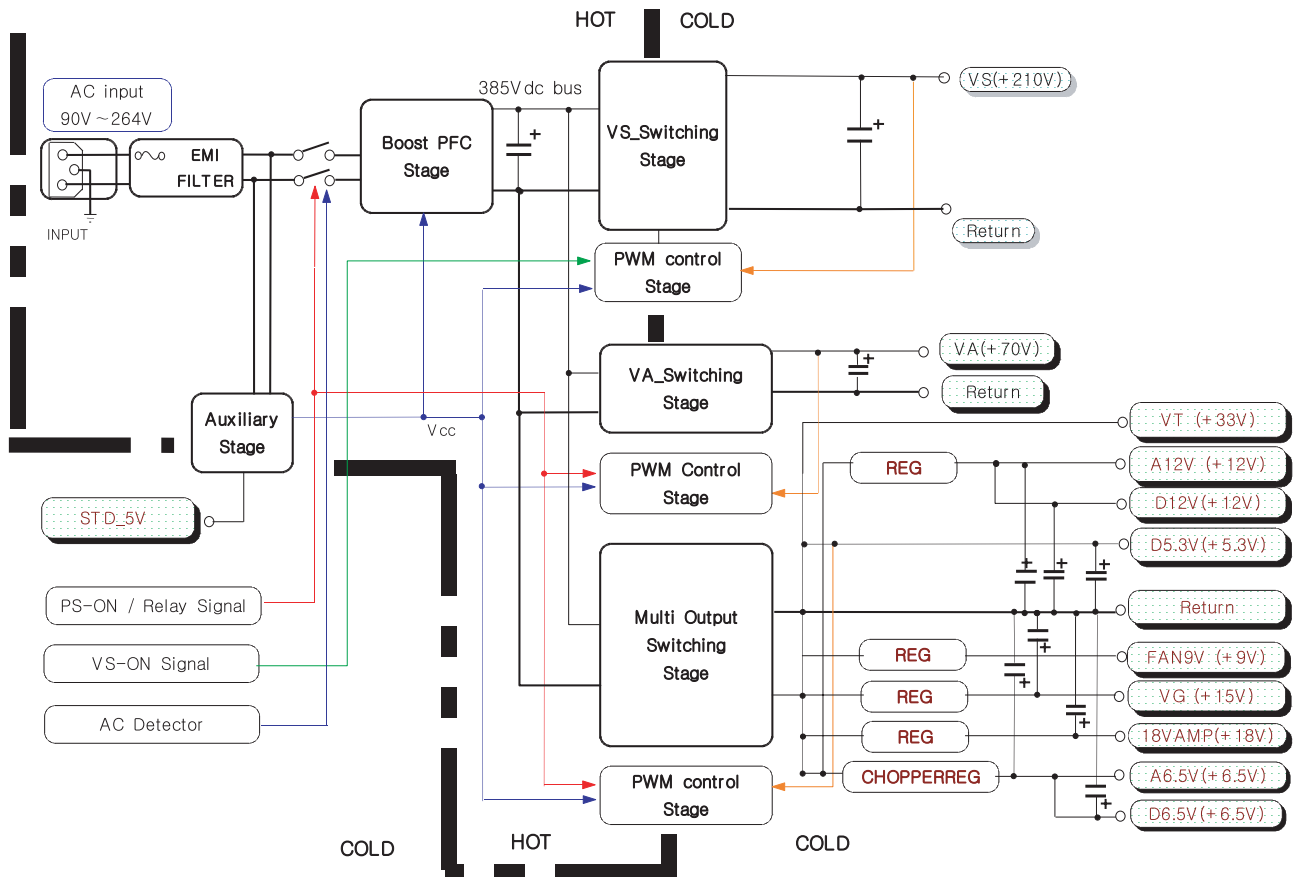
7. Block Diagram

7-1 Overall Block Diagram

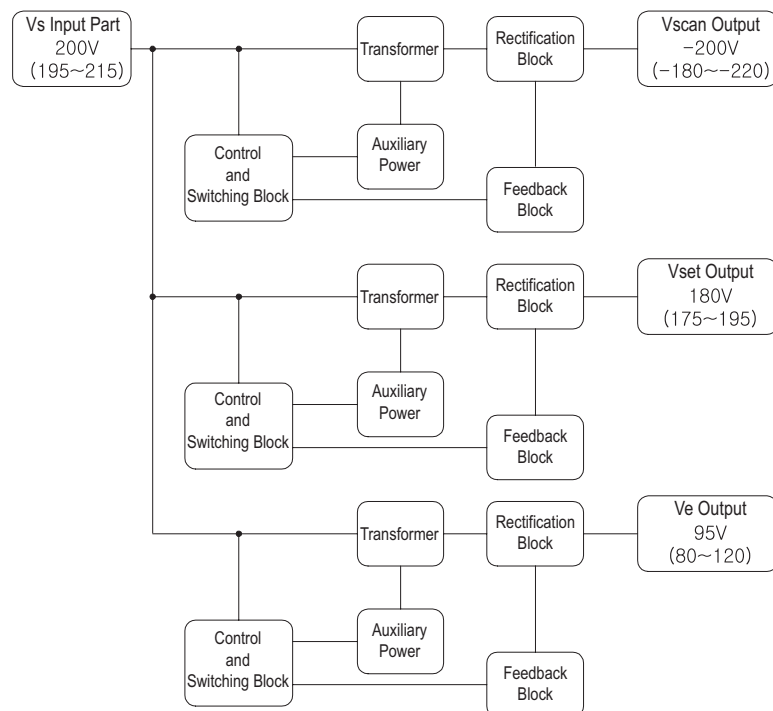


7-2 Partial Block Diagram

7-2-1 Main SMPS Block Diagram

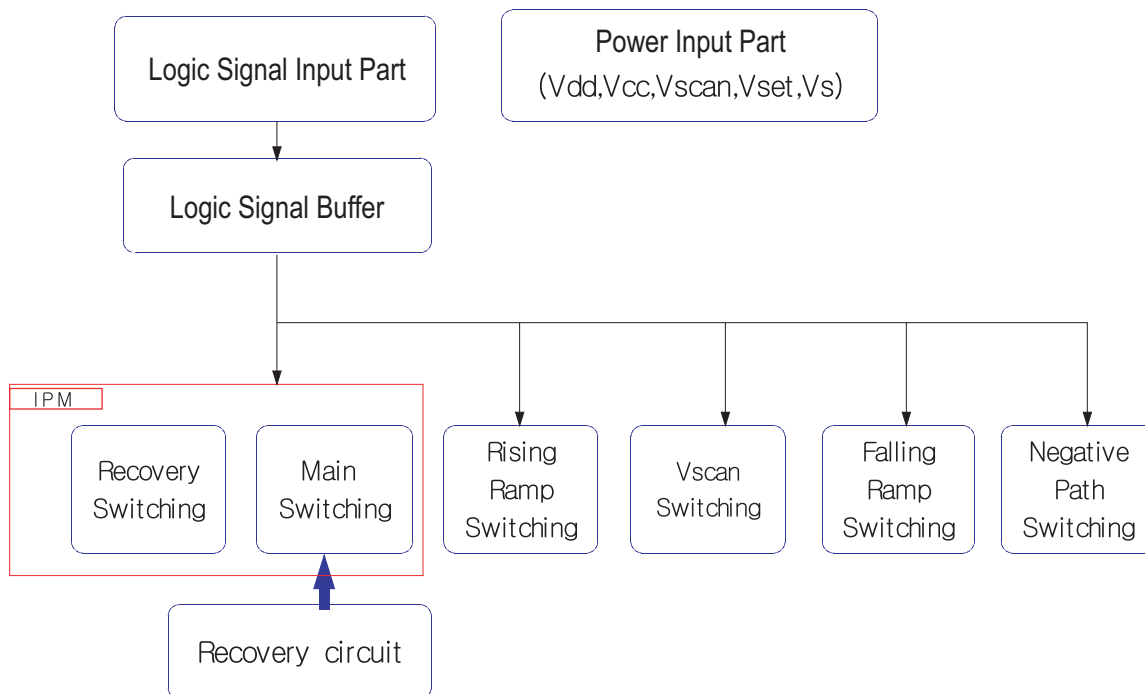


7-2-2 DC-DC SMPS Block Diagram

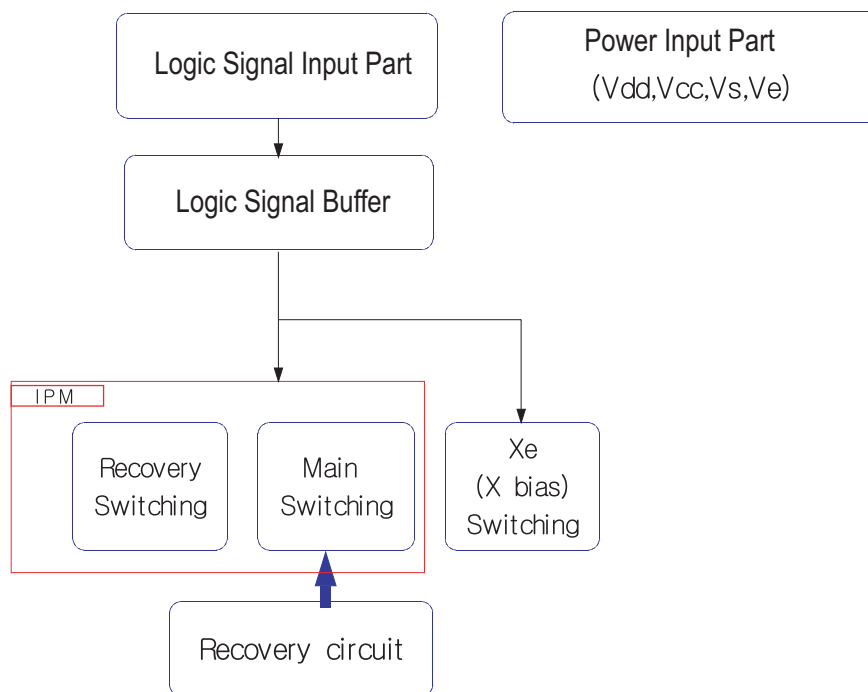


7-2-3 Main Board Block Diagram

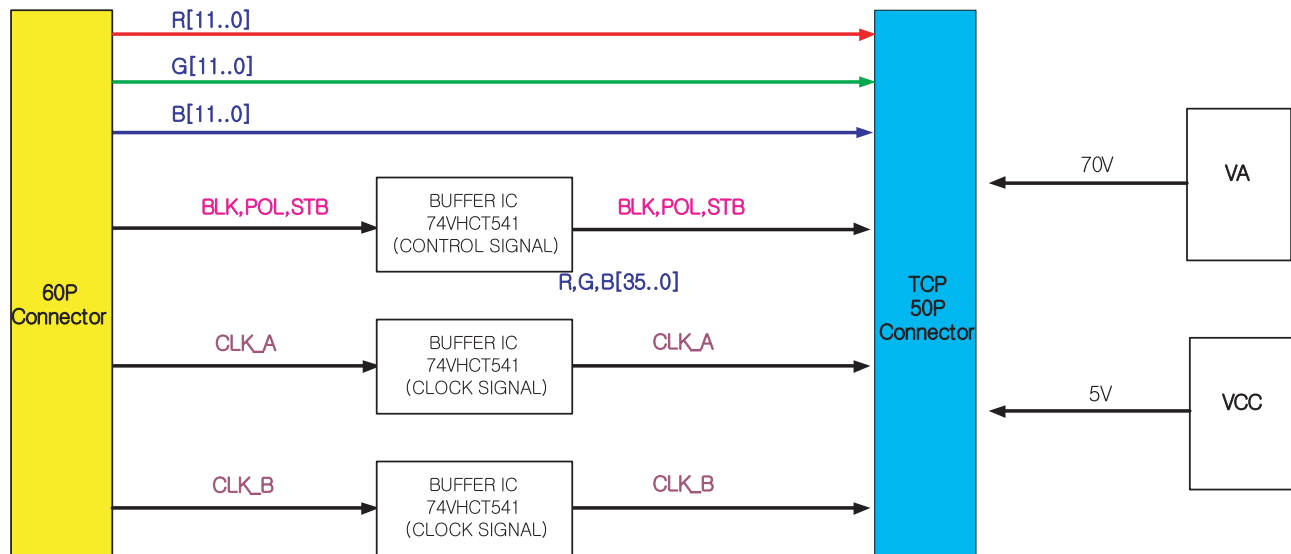
1. Y Main Board



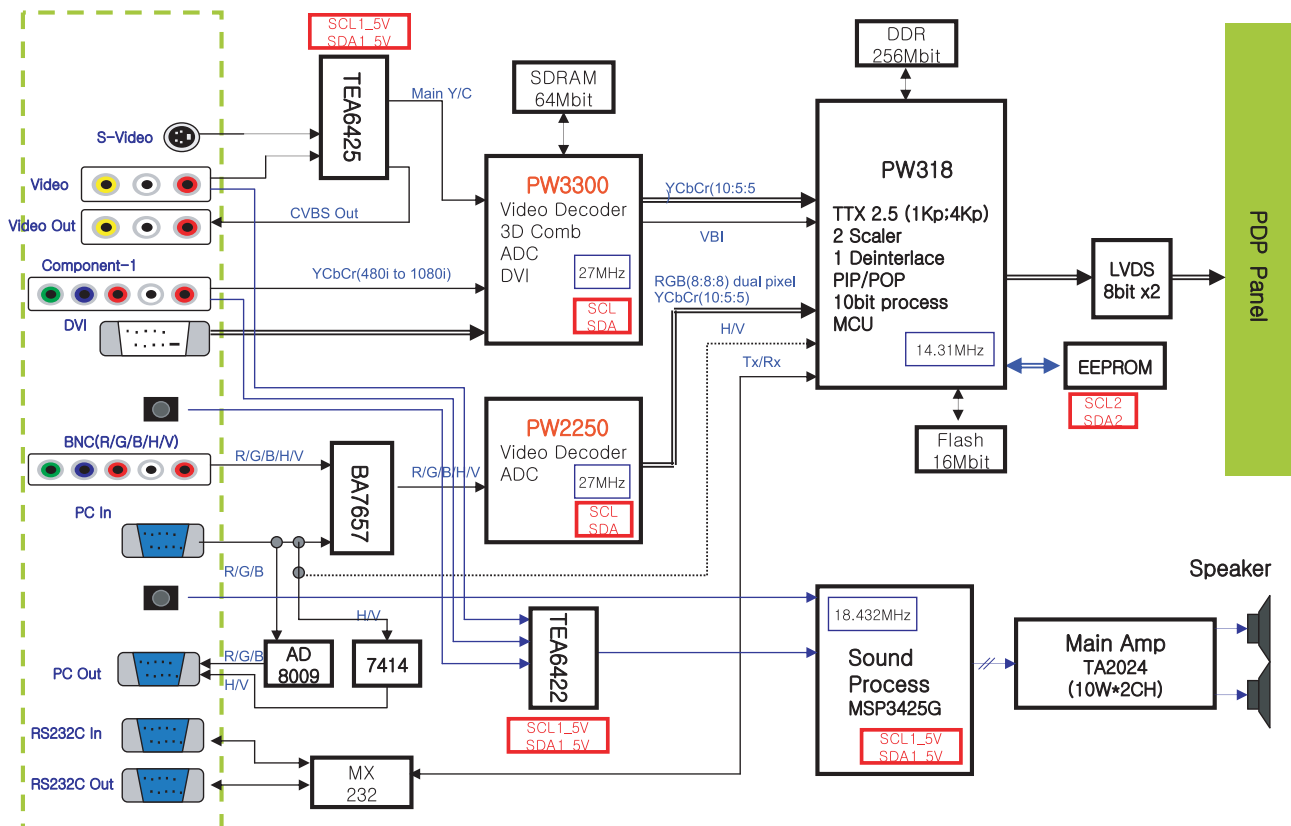
2. X Main Board



7-2-4 Logic Board Block Diagram

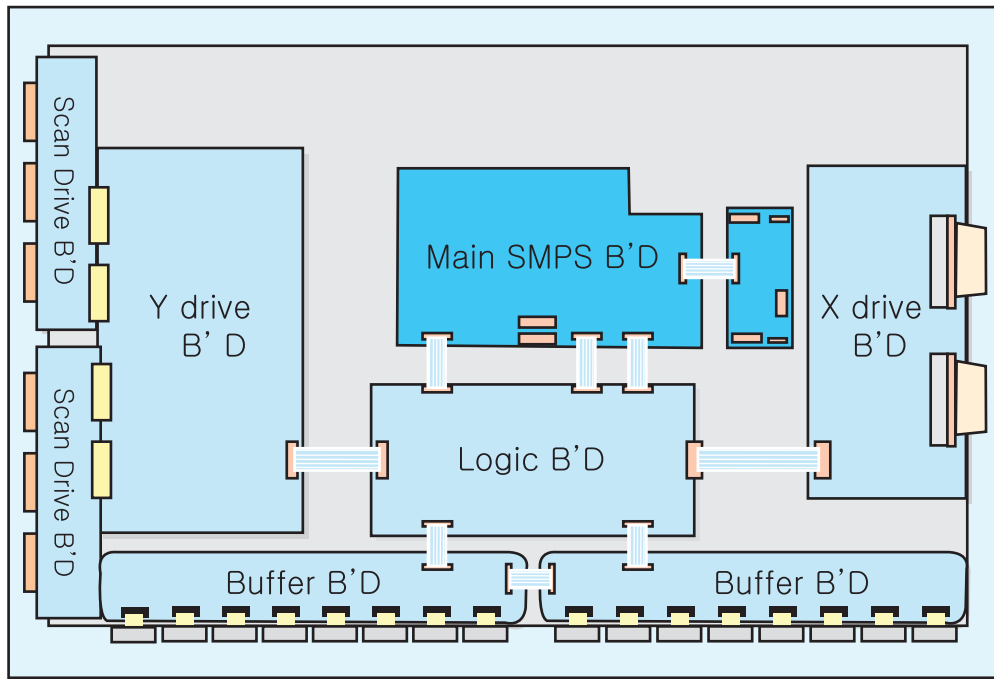


7-2-5 Video Signal Block Diagram

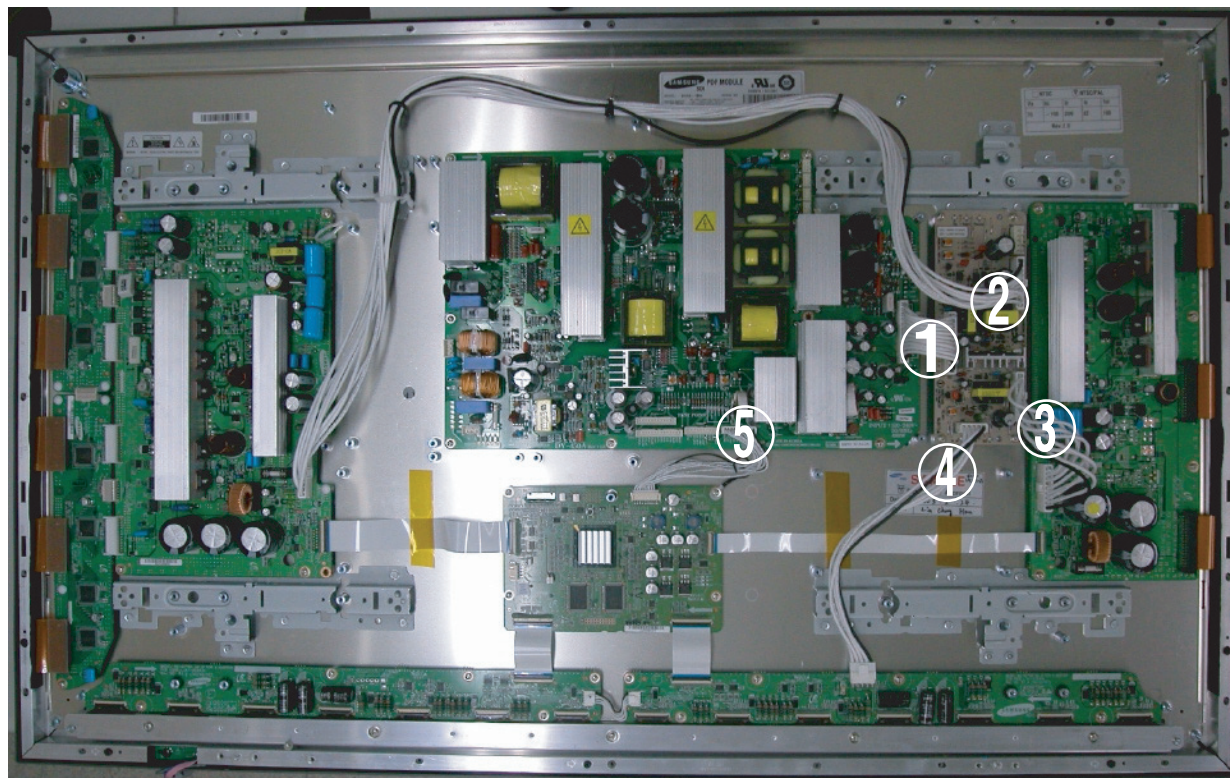


8. Wiring Diagram

8-1 Overall Wiring

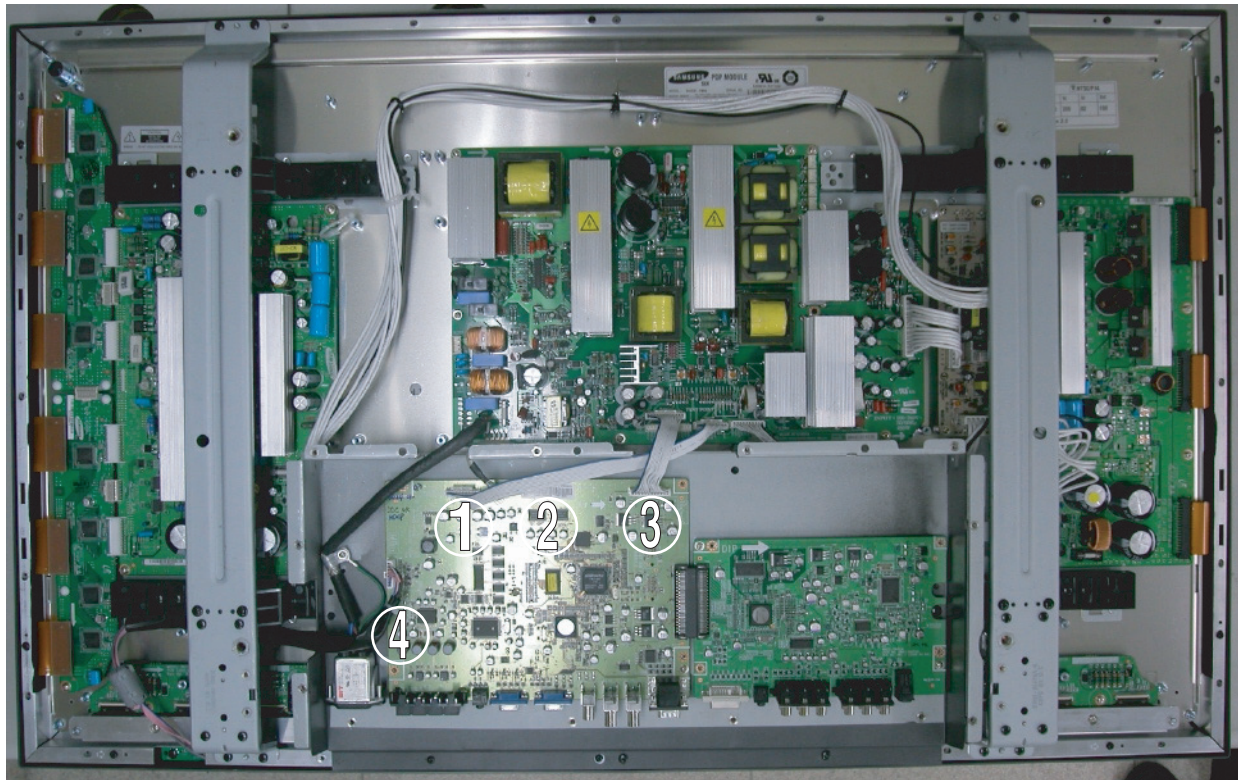


8-2 PDP Module ↔ SMPS Wiring



① CN809(Main SMPS) ↔ CN3(DC-DC SMPS)		② CN2(DC-DC SMPS) ↔ CN5007(Y B'D)		③ CN4(DC-DC SMPS) ↔ CN4000(X B'D)		④ CN6(DC-DC SMPS) ↔ CN2701(F-Buffer)		⑤ CN810(Main SMPS) ↔ CN2013(Logic B'D)	
Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal
1	5.3V	1	Vs	1	Vs	1	D5.3V	1	STB5V
2	Vg	2	Vs	2	Vs	2	Vg	2	VS_ON
3	RTN	3	RTN	3	RTN	3	RTN	3	N.C
4	RTN	4	RTN	4	RTN	4	RTN	4	PS_ON
5	RTN	5	Vset	5	Ve	5	RTN	5	RTN
6	RTN	6	RTN	6	RTN	6	RTN	6	D5.3V
7	RTN	7	Vscan	7	RTN	7	RTN	7	RTN
8	Va	8	RTN	8	Vg	8	Va	8	RTN
9	Va	9	Vg	9	5.3V	9	Va	9	D5.3V
10	N.C	10	5.3V			10	N.C	10	D5.3V
11	Vs					11	Vs		
12	Vs					12	Vs		

8-3 PC(Main) Board ↔ SMPS, Function Board

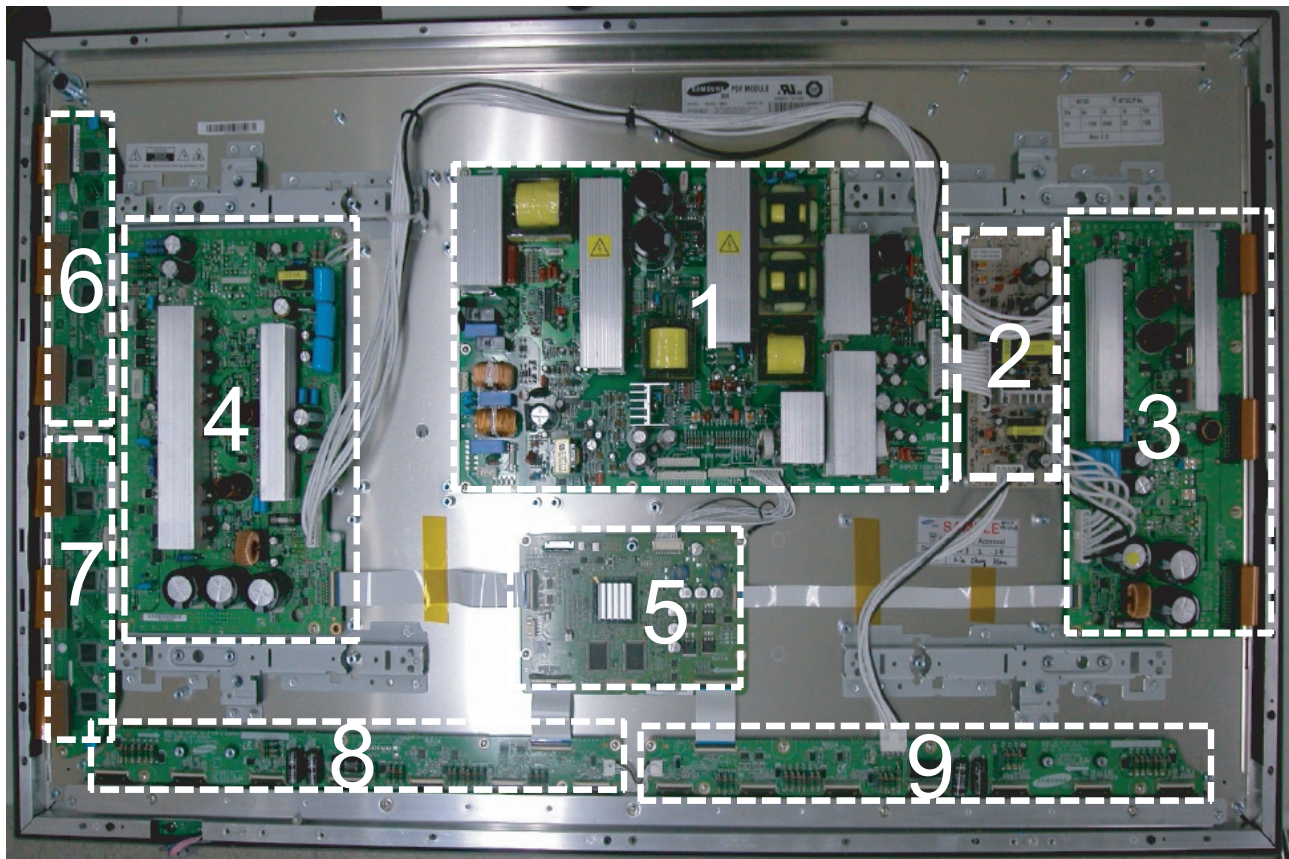


① CN803(Main SMPS) ↔ CN100(PC B'D)		② CN700(PC B'D) ↔ CN2020(LOGIC B'D)						③ CN804-1(Main SMPS) ↔ CN101(PC B'D)		④ CN101(Fucntion) ↔ CN500(PC B'D)	
Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal
1	RTN	12	TXOUT3+	23	TXOUT1B-	1	FAN_D	1	5V_ST		
2	VT	13	TXOUT3-	24	TXOUT1+	2	FAN_ON	2	GND		
3	RTN	14	TXCLKOUTB+	25	TXOUT1-	3	STD_5V	3	IRRCVR0		
4	RTN	15	TXCLKOUTB-	26	GND	4	GND	4	LED_RED		
5	18VAMP	16	TXCLKOUT+	27	GND	5	PS_ON	5	LED_GRN		
6	18VAMP	17	TXCLKOUT-	28	TXOUT0+	6	D12V	6	KEY1		
7	RTN	18	GND	29	TXOUT0-	7	GND	7	KEY2		
8	A12V	19	GND	30	GND	8	GND	8	GND		
9	RTN	20	TXCLKOUT2+	31	GND	9	VCA				
10	A6V	21	TXCLKOUT2-	32	GND	10	VCS				
		22	TXOUT1B+	33	GND	11	GND				
						12	D5.3V				

MEMO

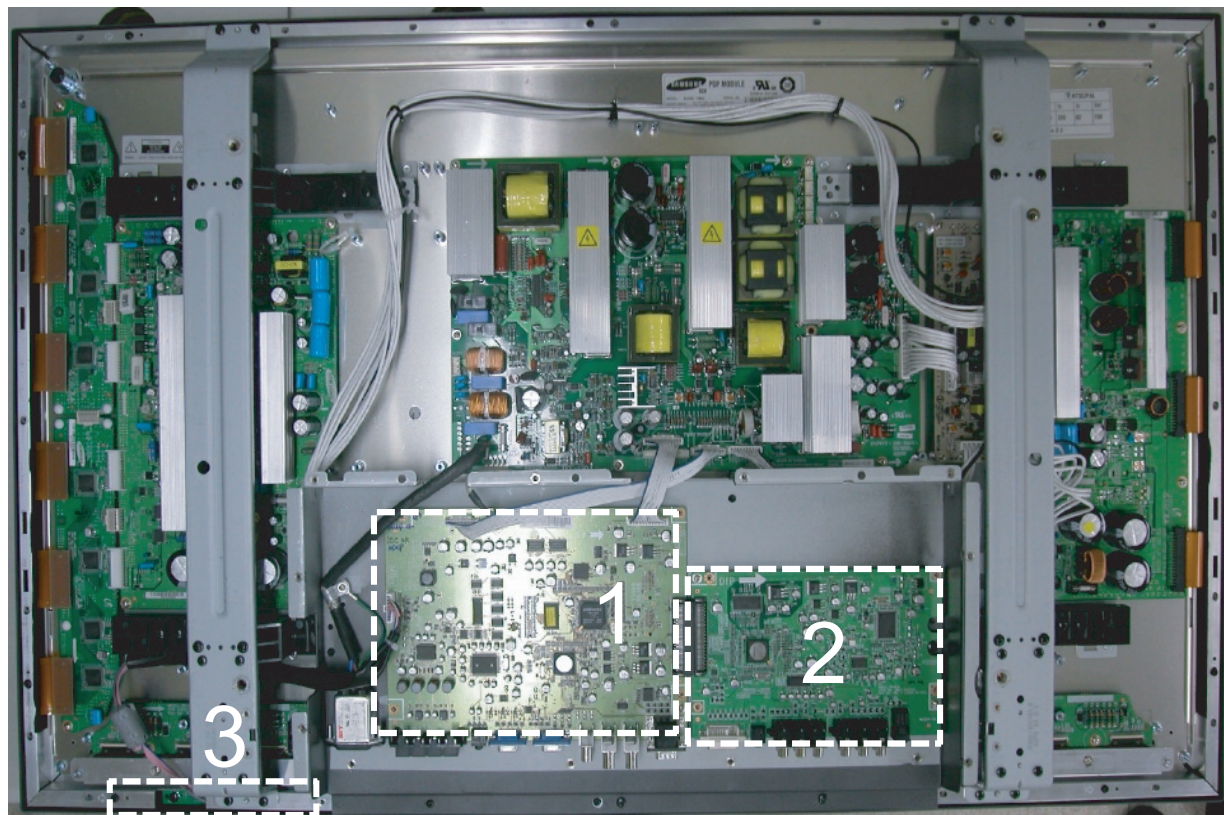
9. PCB Diagram

9-1 PDP Module, SMPS Layout



No	Name	Code No	Description
1	ASSY PCB P-SMPS	BN96-01923A	Main SMPS
2	ASSY PCB P-SMPS	BN96-01856A	DC-DC SMPS
3	ASSY PDP P-X MAIN BOARD	BN96-02038A	X MAIN BOARD
4	ASSY PDP P-Y MAIN BOARD	BN96-02039A	Y MAIN BOARD
5	ASSY PDP P-LOGIC BOARD	BN96-02042A	LOGIC BOARD
6	ASSY PDP P-Y BUFF UPPER BOARD	BN96-02040A	Y BUFF UPPER BOARD
7	ASSY PDP P-Y BUFF LOWER BOARD	BN96-02041A	Y BUFF LOWER BOARD
8	ASSY PDP P-ADDRESS E-BUFF BOARD	BN96-02043A	ADDRESS E-BUFF BOARD
9	ASSY PDP P-ADDRESS F-BUFF BOARD	BN96-02044A	ADDRESS F-BUFF BOARD

9-2 Video Board, Function Key Board



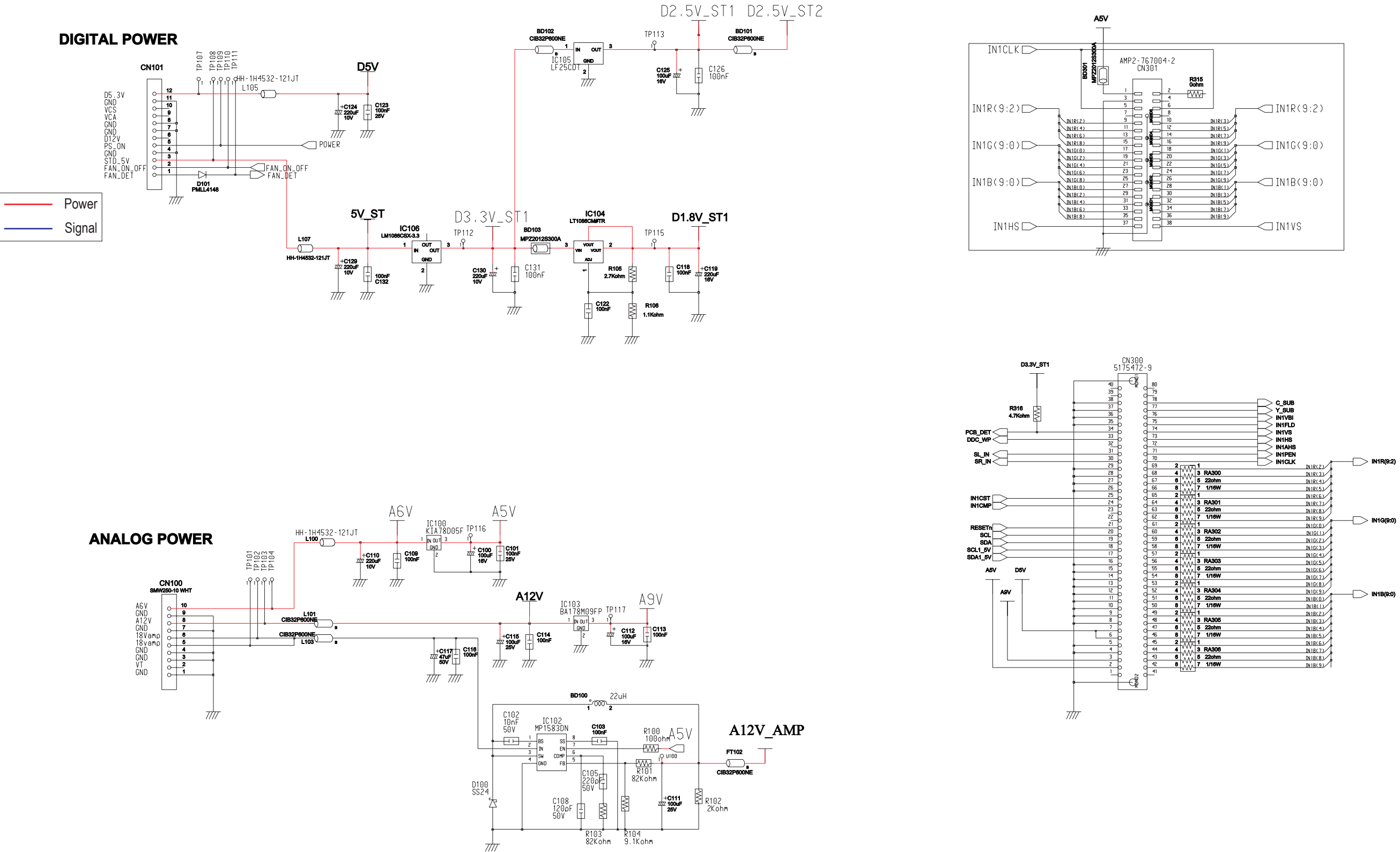
No	Name	Code No	Description
1	ASSY PCB MISC PC-MAIN	BN94-00685A	PC BOARD
2	ASSY PCB MISC AV-SUB	BN94-00734A	AV BOARD
3	ASSY PCB MISC-CONTROL	BN94-00696A	Function Key Board

10. Schematic Diagram

10-1 PC Board

10-1-1 Power

This Document can not be used without Samsung's authorization.

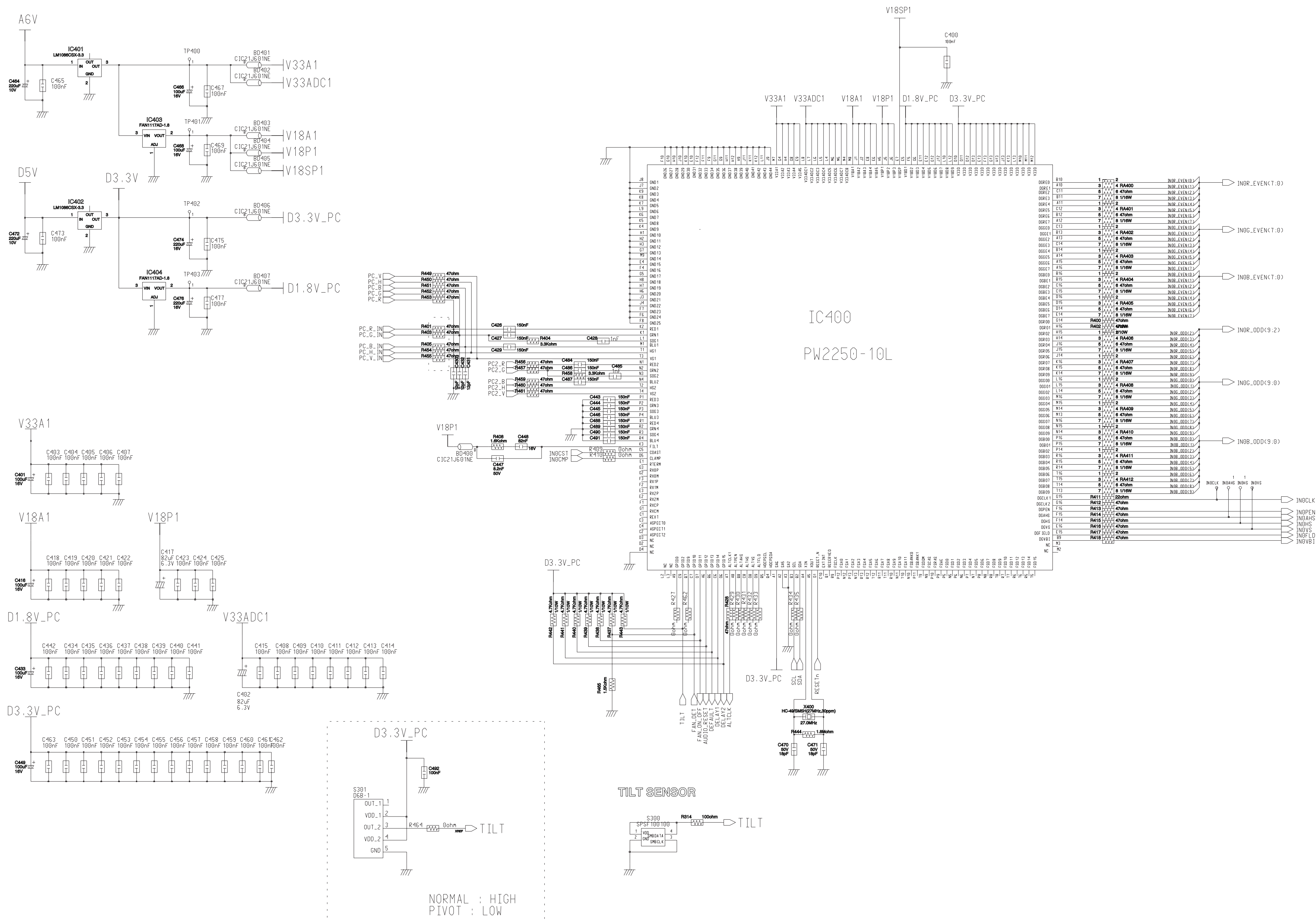


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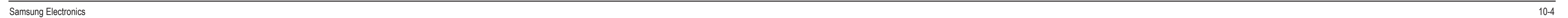


10-1-3 PW2250

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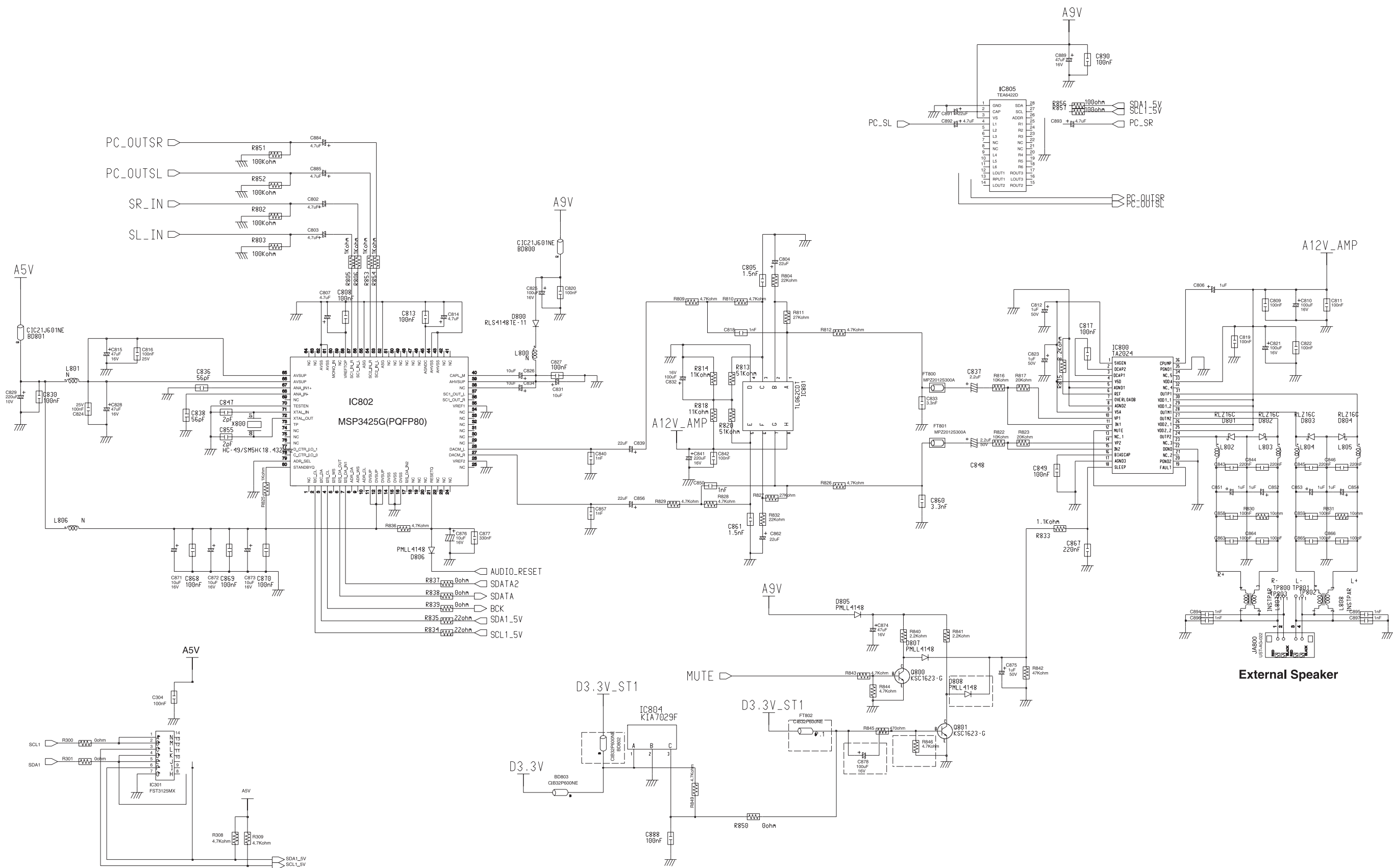


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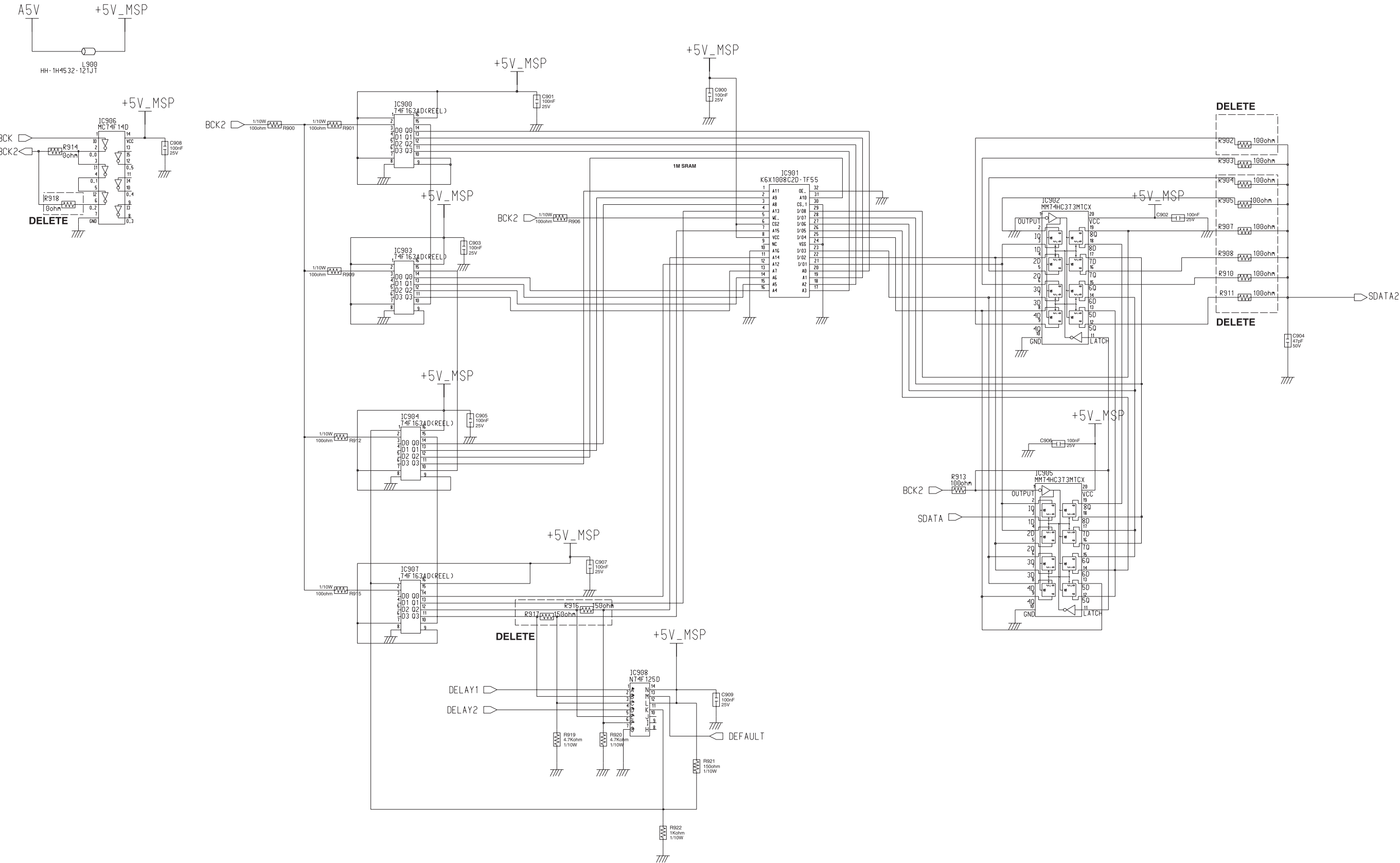
10-1-6 Audio(MSP3425G)

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10-1-7 Sound Delay

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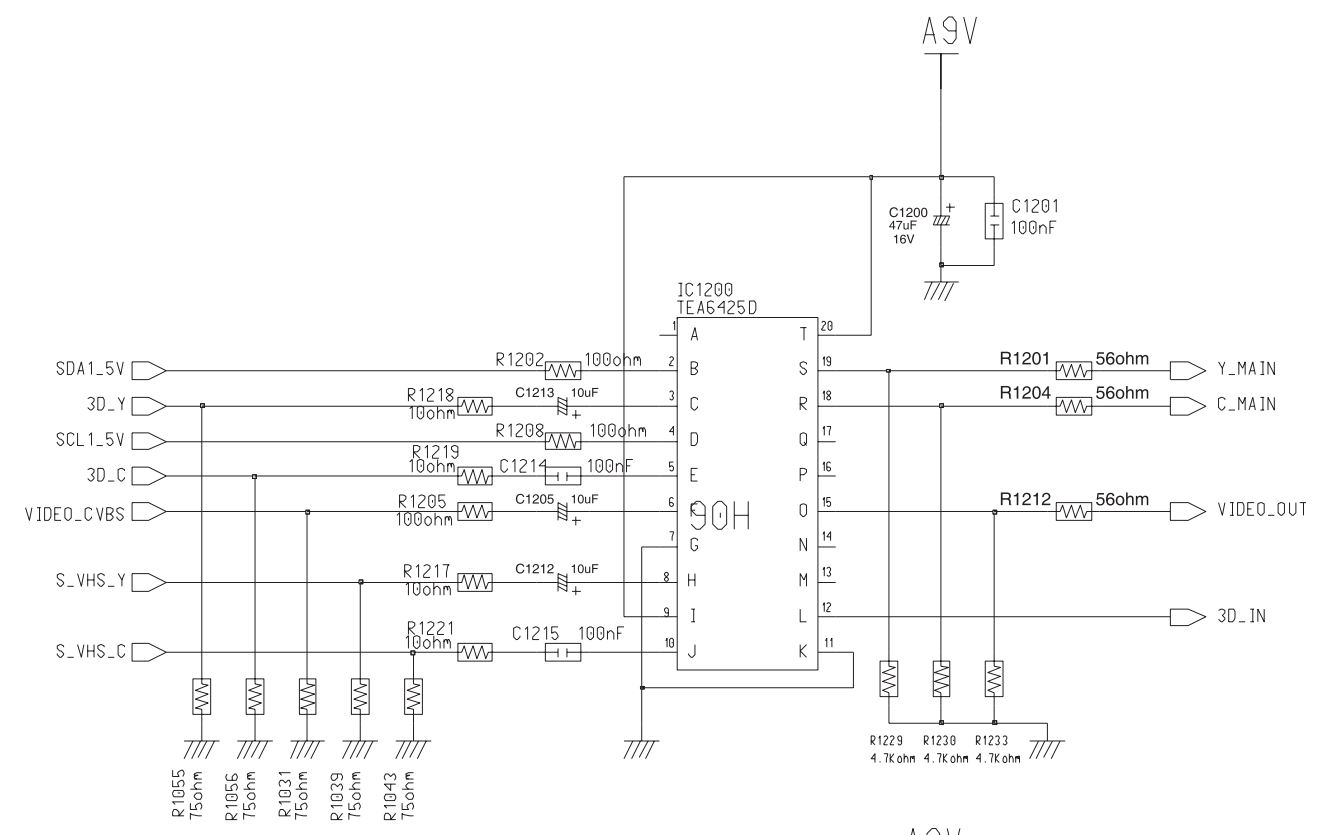
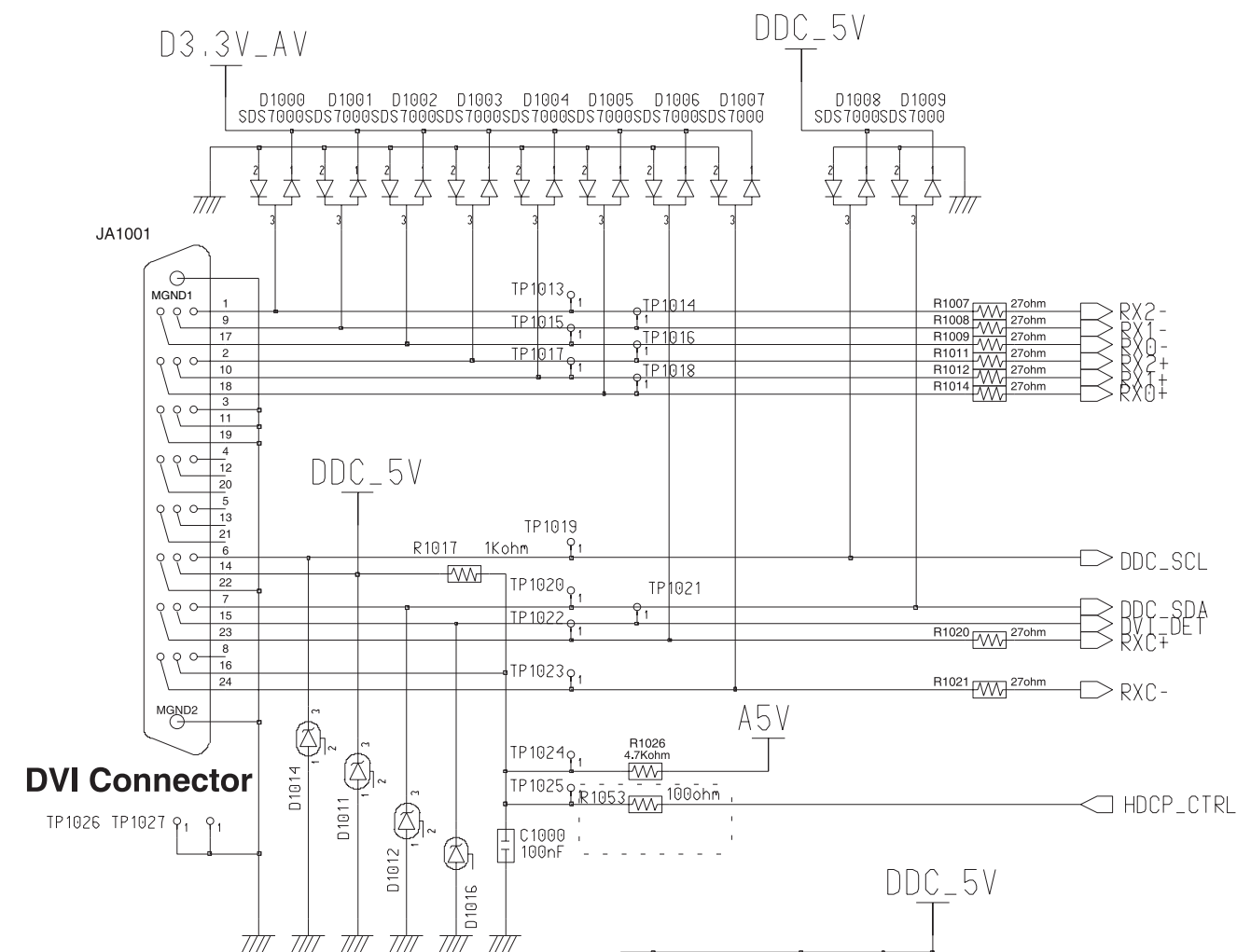
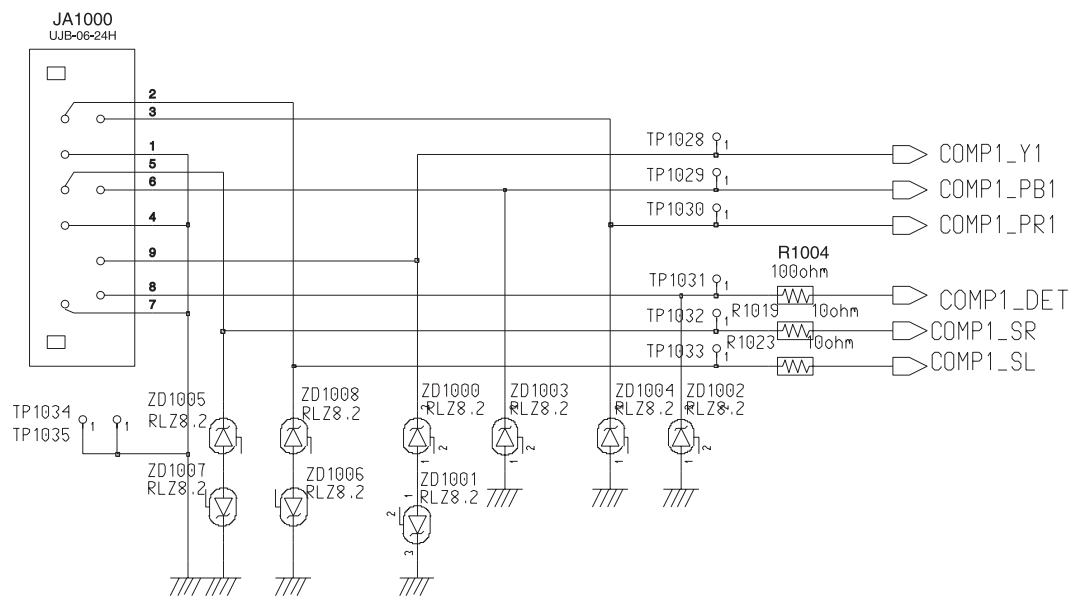


10-2 AV Board

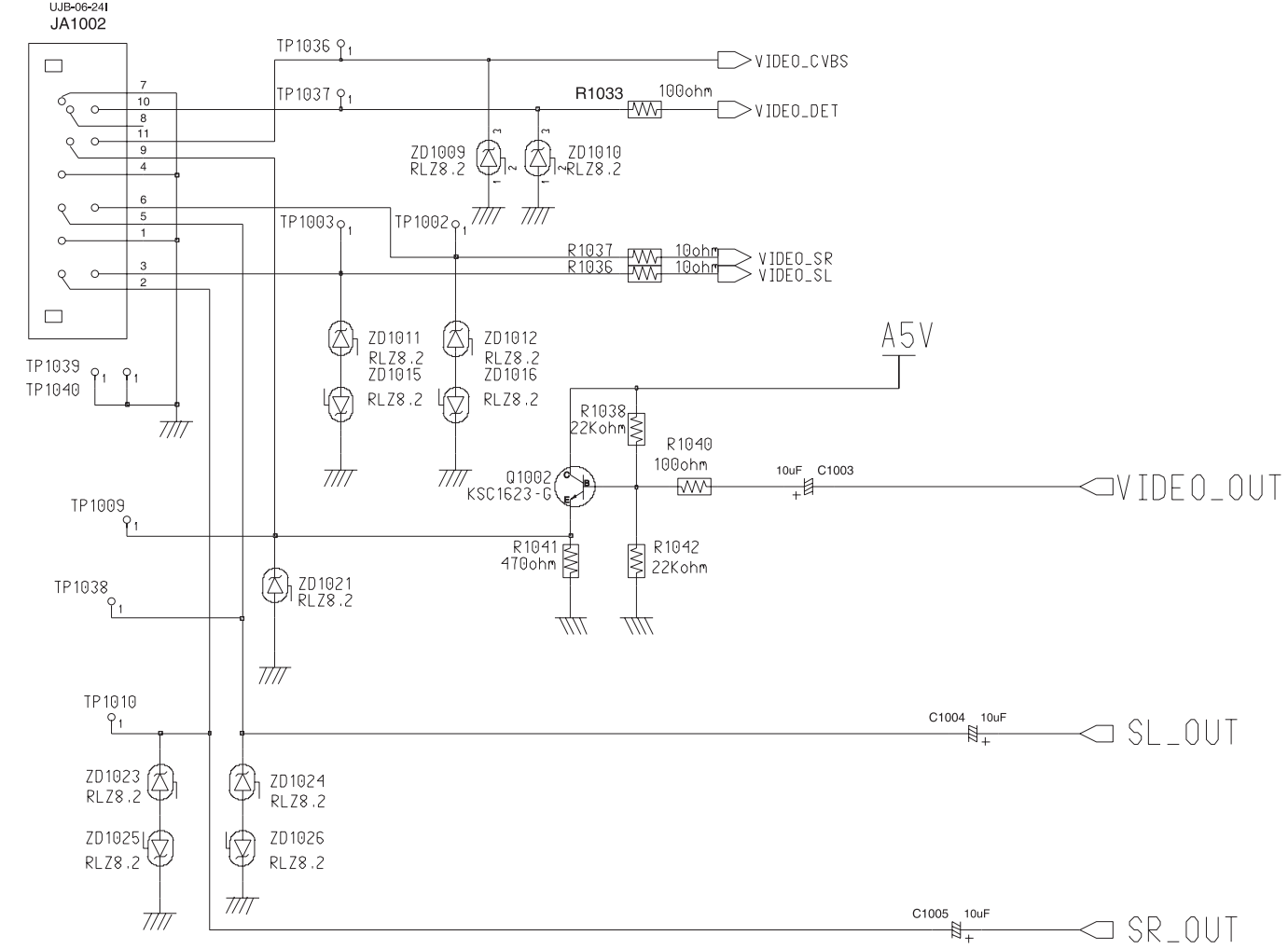
10-2-1 Interface Connectors

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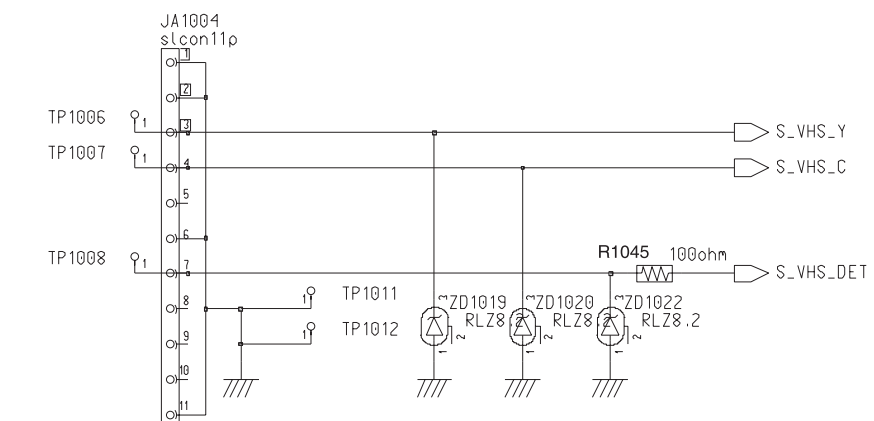
COMPONENT1



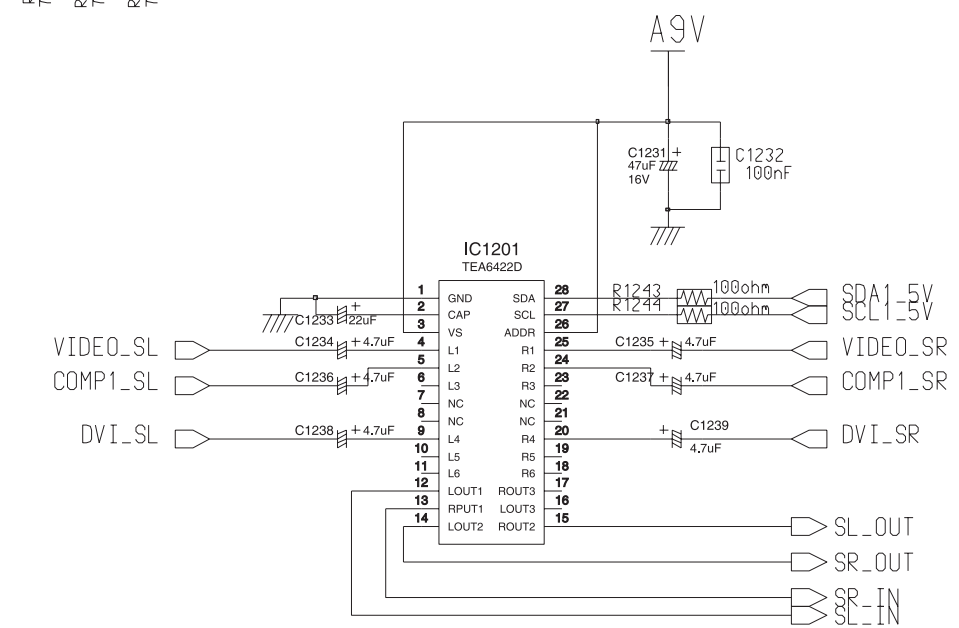
Video



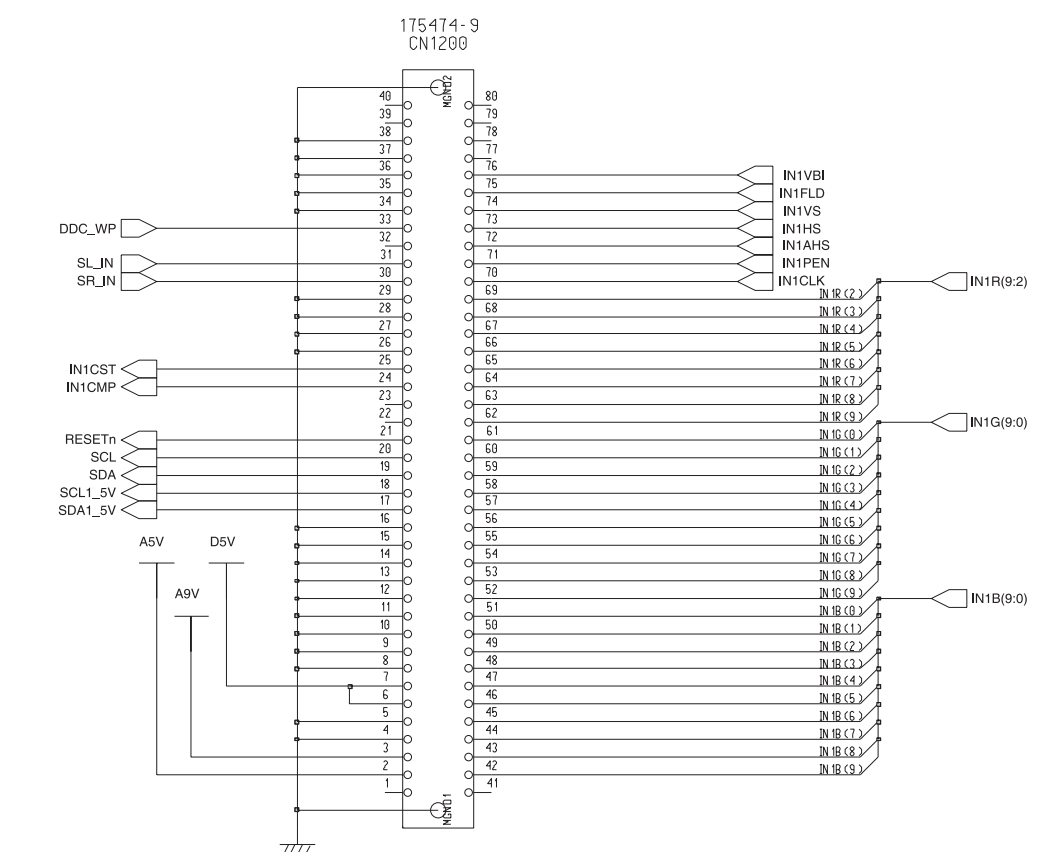
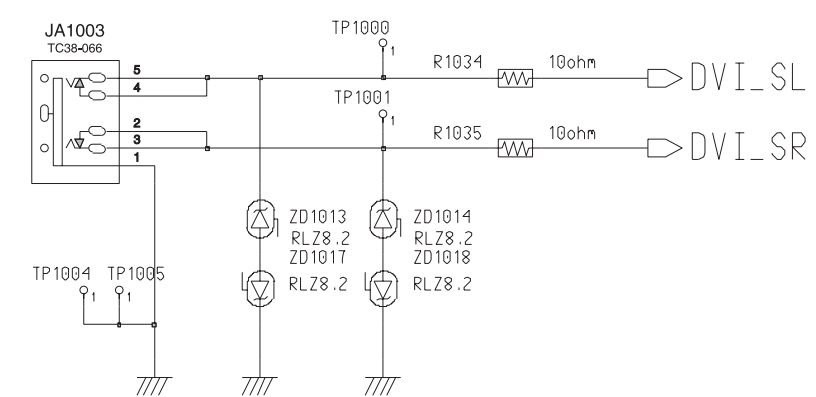
S-Video



DIGITAL EDID EPROM

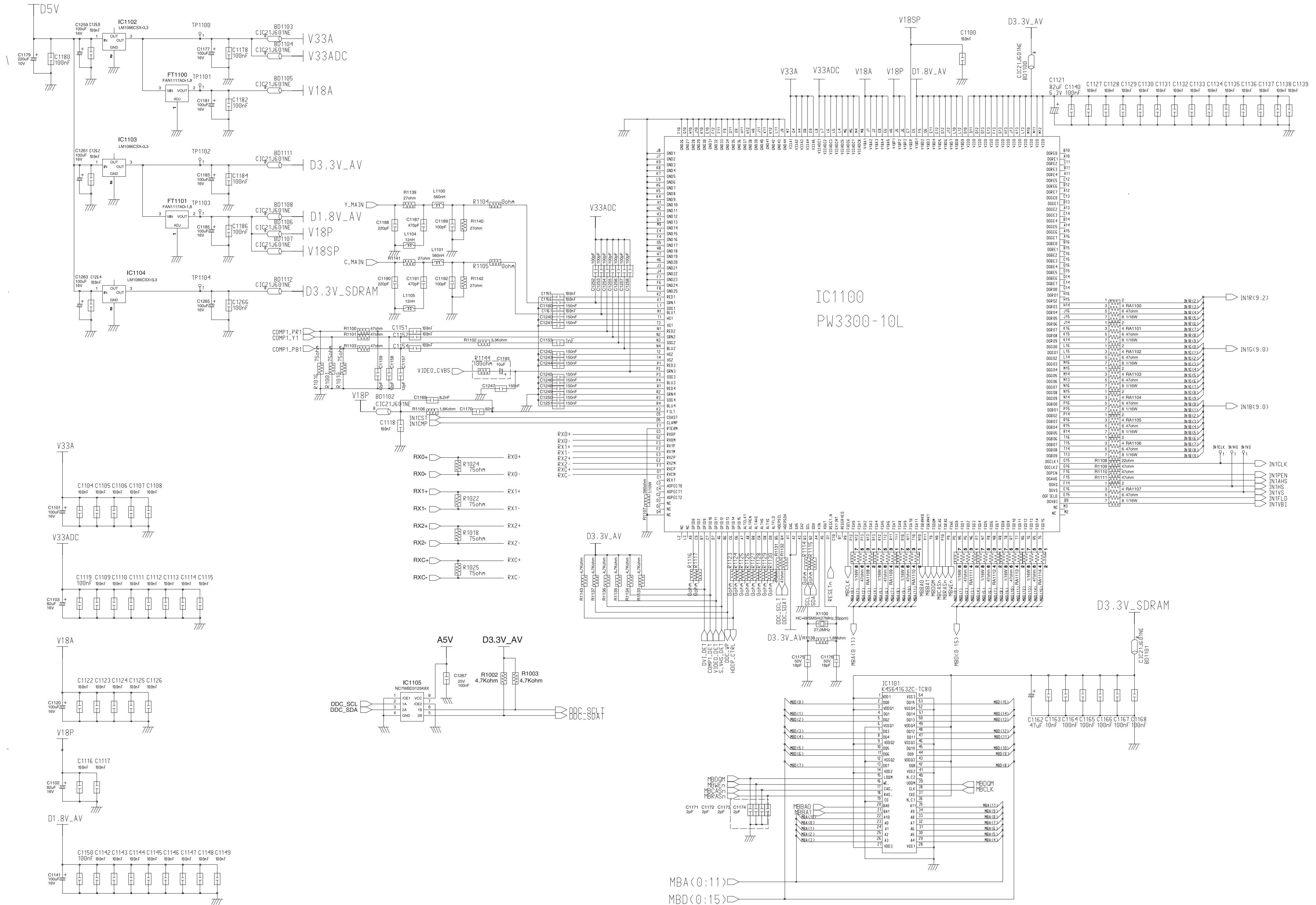


DVI SOUND



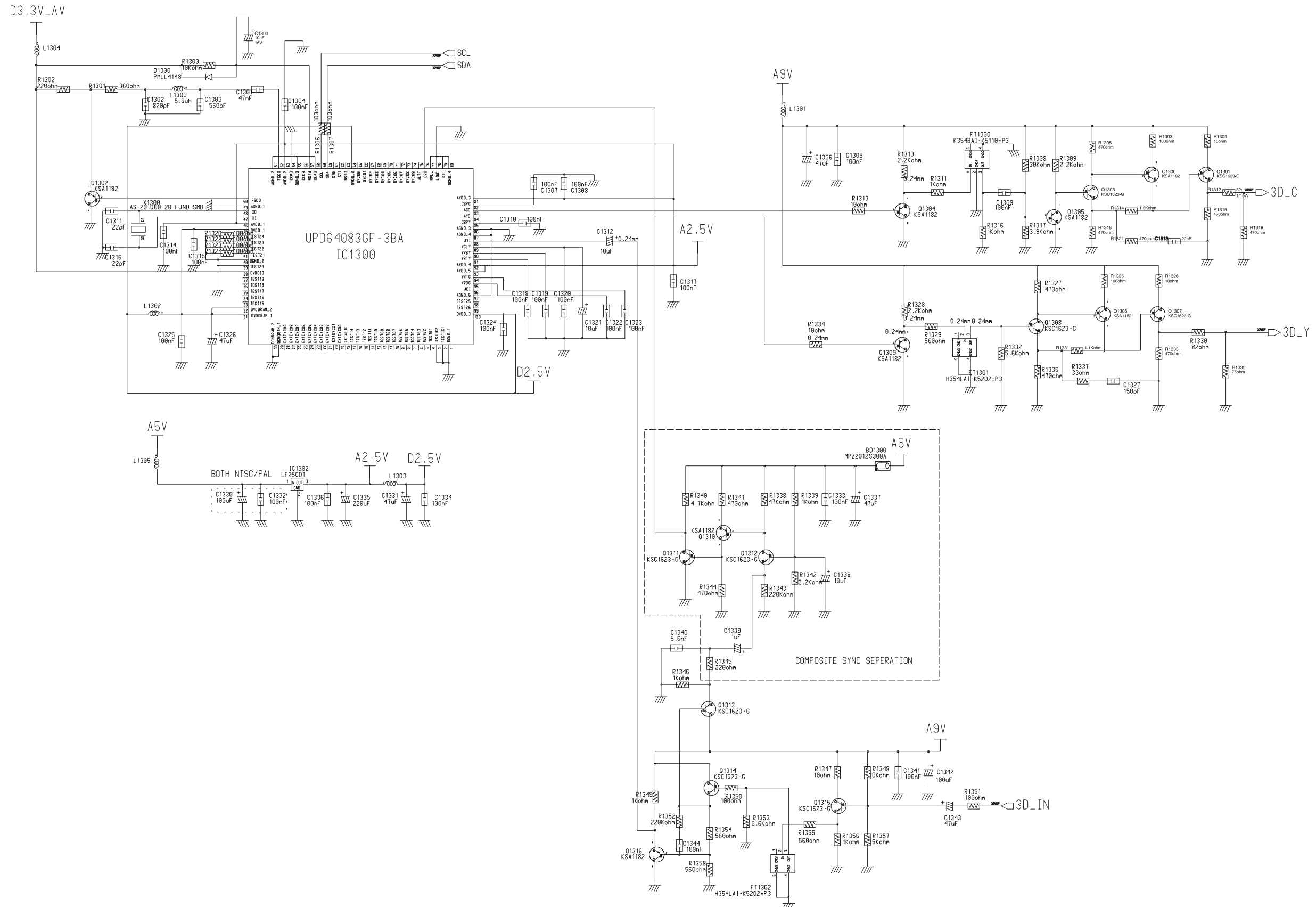
10-2-2 PW3300

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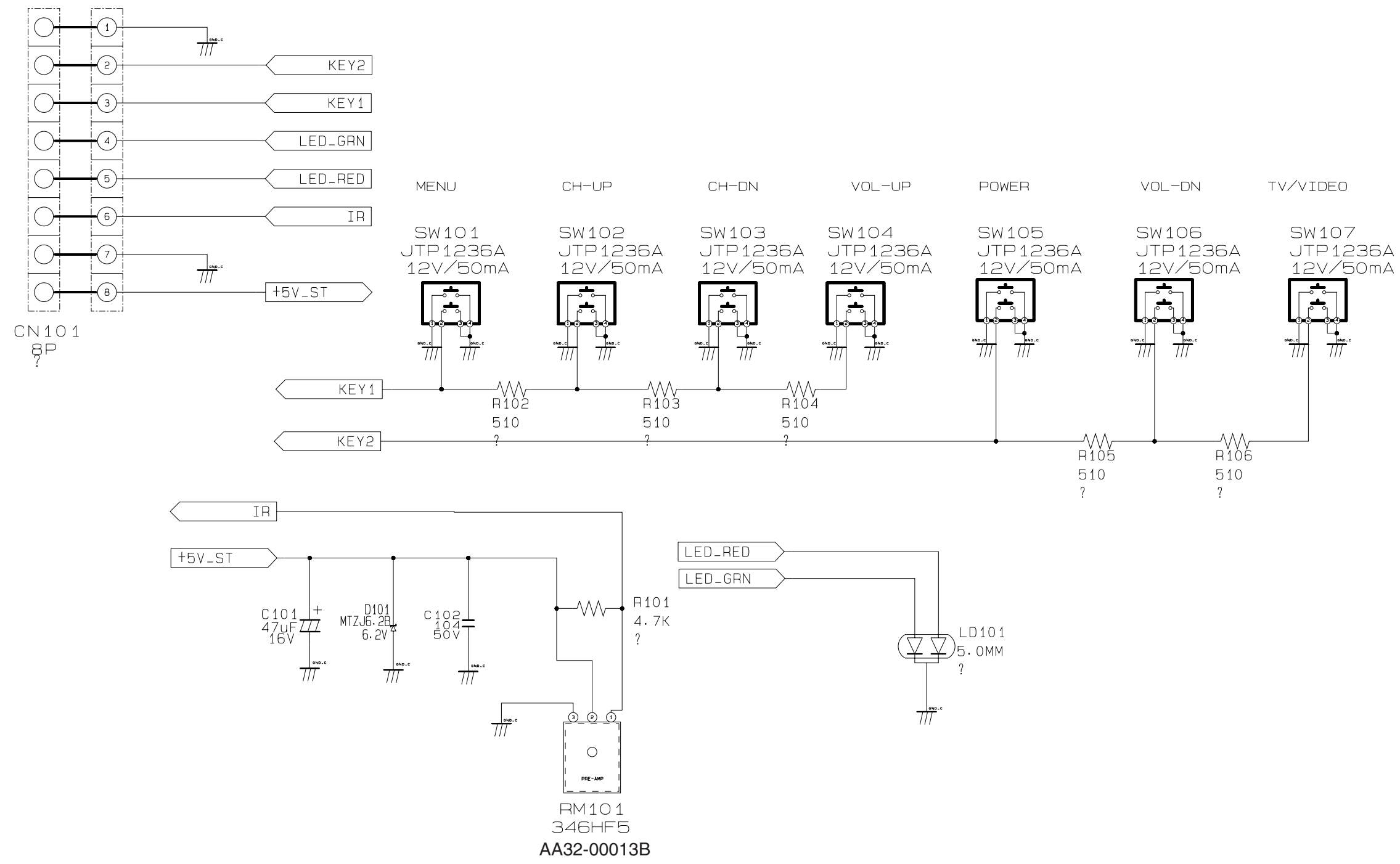
10-2-3 3D COMP

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10-3 CONTROL

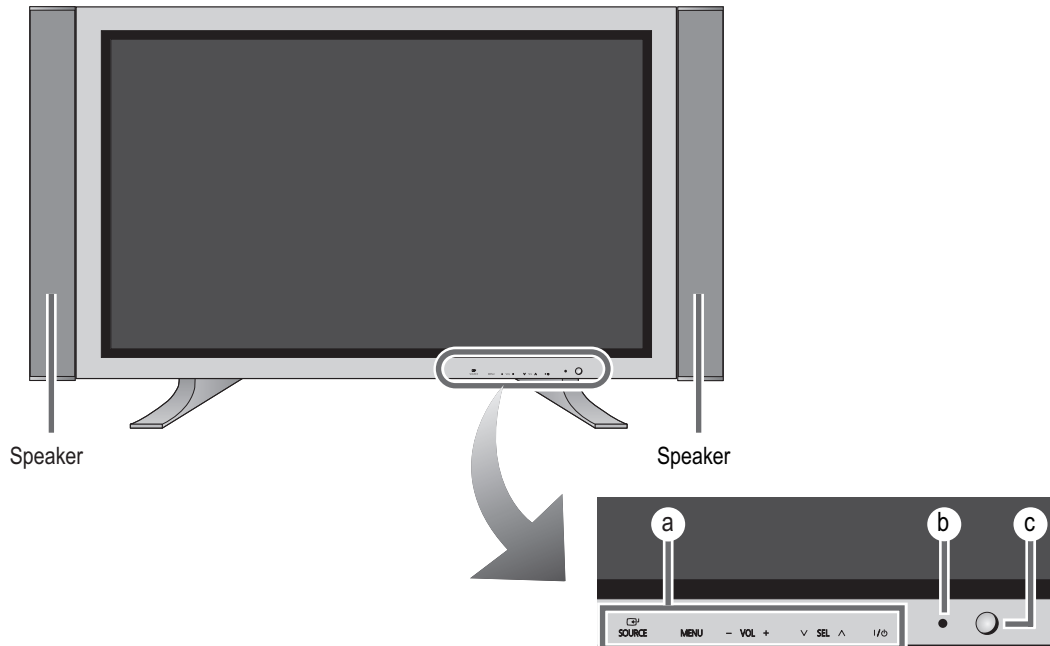
This Document can not be used without Samsung's authorization.



11. Operation Instruction & Installation

11-1 Product Features and Functions

11-1-1 Front of the PDP Monitor



a

SOURCE

- Select the external input source.
- Store your settings in the menu.
- When the Main menu is displayed on screen, the Main menu is not operated with source key.

MENU

Display the on-screen menu.

- VOL +

- Adjust the volume.
- Adjust an option value respectively.

(VOL + : Enter to the selected menu.)

▽ SEL ▲

Control the cursor in the menu.

I /

Press to turn the PDP Monitor on and off.

b

Power Indicator

- Power Off; Black
- Power On; Green

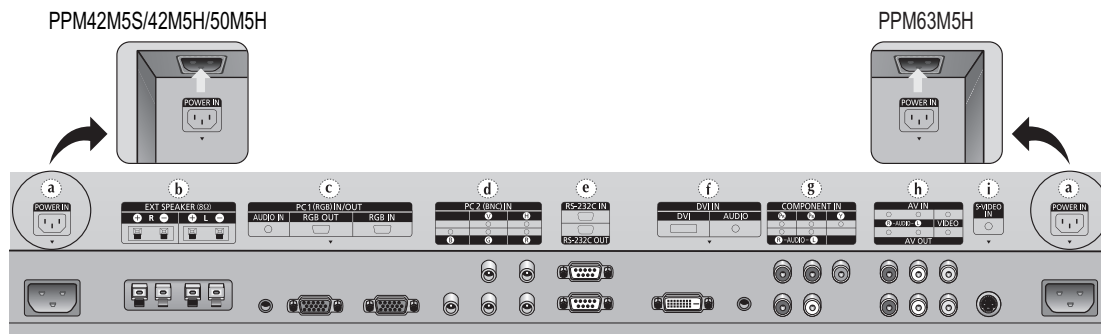
c

Remote Control Sensor

Aim the remote control towards this spot on the PDP Monitor.

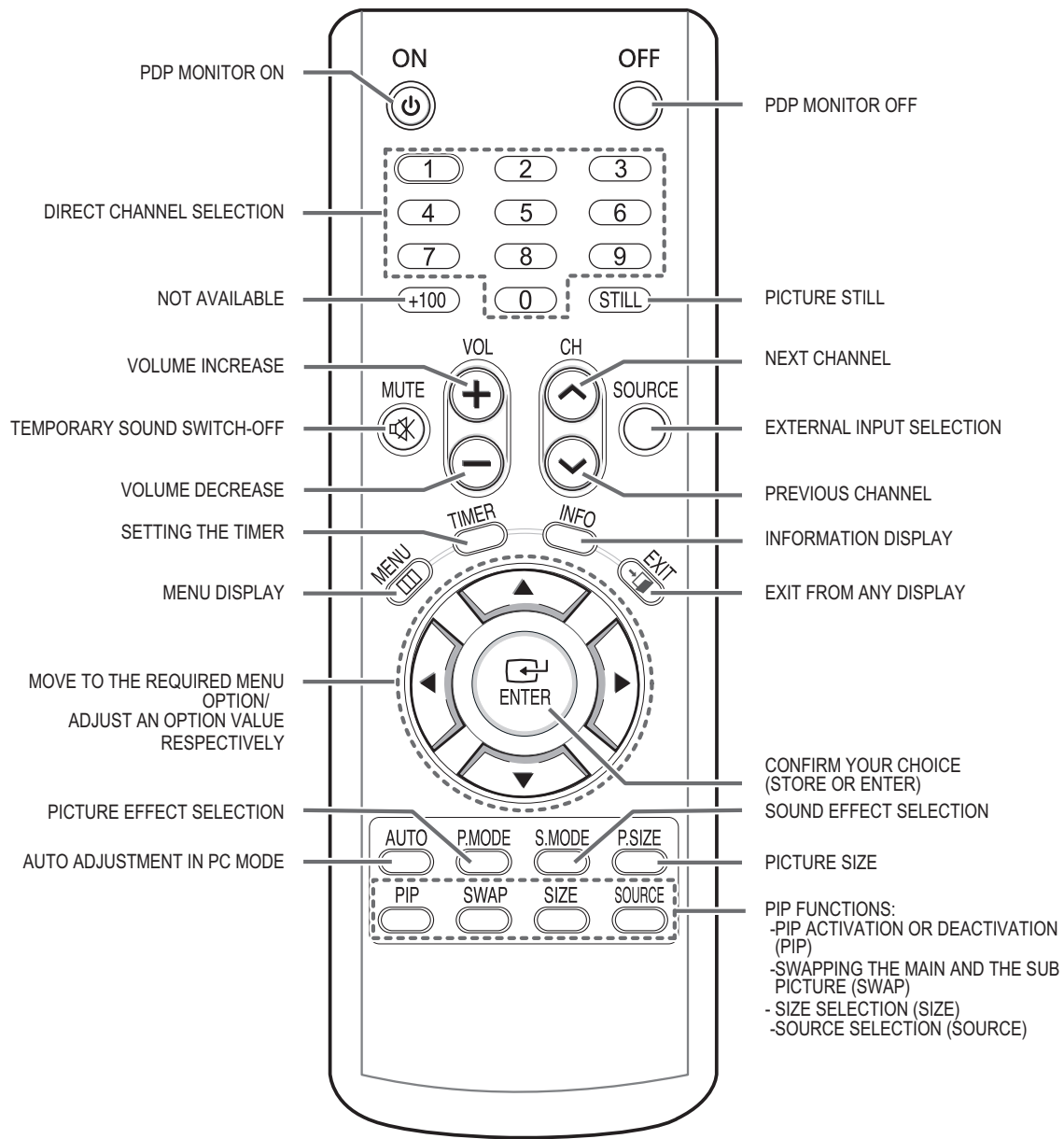
- ◆ You can use the SEL ▲, ▼ buttons to switch on the PDP Monitor when it is in standby mode depending on the model.
- ◆ The VOL +, -, and SEL ▲, ▼ buttons have the same function as the ▲/▼/◀/▶ buttons on the remote control.
- ◆ If the remote control no longer works or you have misplaced it, you can use the controls on the panel of the PDP Monitor.

11-1-2 Rear Panel



- | | |
|---|---|
| <p>a) POWER IN
Connect the supplied power cord.</p> <p>b) EXT SPEAKER (8Ω)
Connect external speakers.</p> <p>c) PC1 IN/OUT</p> <ul style="list-style-type: none"> – IN : Connect to the video output jack on your PC. – OUT : Connect to the video input jack on external devices. – AUDIO : Connect to the audio output jack on your PC. <p>➤ AUDIO is an audio input jack for PC1 and PC2 modes.</p> <p>d) PC2 (BNC) IN
Connect for RGB HV video signal input from the PC.</p> <p>➤ "PC Mode" from this page onward means PC1/PC2 mode using RGB1(PC1) and RGB2(PC2).</p> <p>e) RS-232C</p> <ul style="list-style-type: none"> – IN : Used for the MDC function when connecting PC or RS-232C output of another PDP Monitor. – OUT : Used for the MDC function when connecting with RS-232C input of another PDP Monitor. | <p>f) DVI IN</p> <ul style="list-style-type: none"> – DVI : Connect to the video output jack for device with DVI output. – AUDIO : Connect to the audio output jack for devices with DVI output. <p>g) COMPONENT IN
Video (Y/P_B/P_R) and audio (L/R) inputs for component.</p> <p>h) AV (VIDEO/AUDIO L/R)</p> <ul style="list-style-type: none"> – IN : Video and audio inputs for external devices, such as a camcorder or VCR. – OUT : Outputs for external devices. <p>i) S-VIDEO IN
Video input for external devices with an S-Video output, such as a camcorder or VCR.</p> |
|---|---|

11-1-3 Remote Control



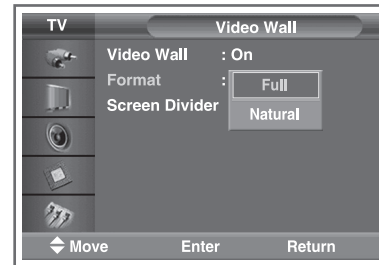
11-2 New Features

11-2-1 Video Wall Natural Mode

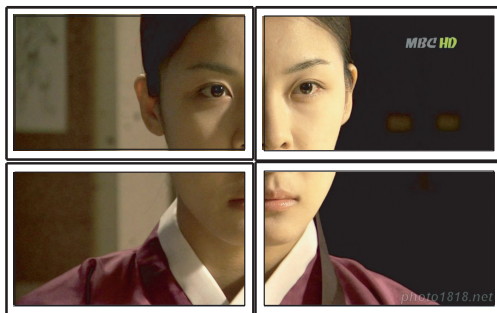
Select the required option by pressing the▲ or ▼ button.

Result : The following options are available.

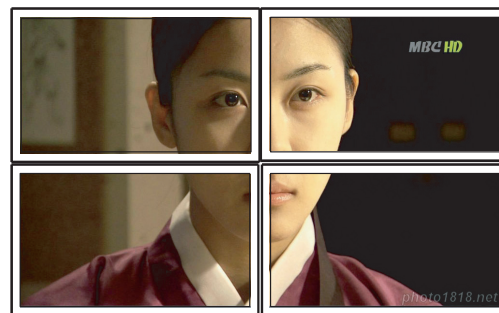
- ◆ Full : This option displays divided images on multiple monitors without missing parts as if only the viewable part of the separate monitors were simply part of a large single monitor.
- ◆ Natural : This option displays divided images on multiple monitors as if the separate monitors were simply part of a large single monitor. Therefore there are missing parts on the edge of the monitors.



Press the ENTER () button.



[Full Mode]



[Natural Mode]

11-2-2 PIP Settings (X - This PIP combination is not available. O - This PIP combination is available.)

Main \ Sub	AV	S-Video	Component	PC1	PC2(BNC)	DVI
AV	X	X	X	O	O	X
S-Video	X	X	X	O	O	X
Component	X	X	X	O	O	X
PC1	O	O	O	X	X	O
PC2(BNC)	O	O	O	X	X	O
DVI	X	X	X	O	O	X

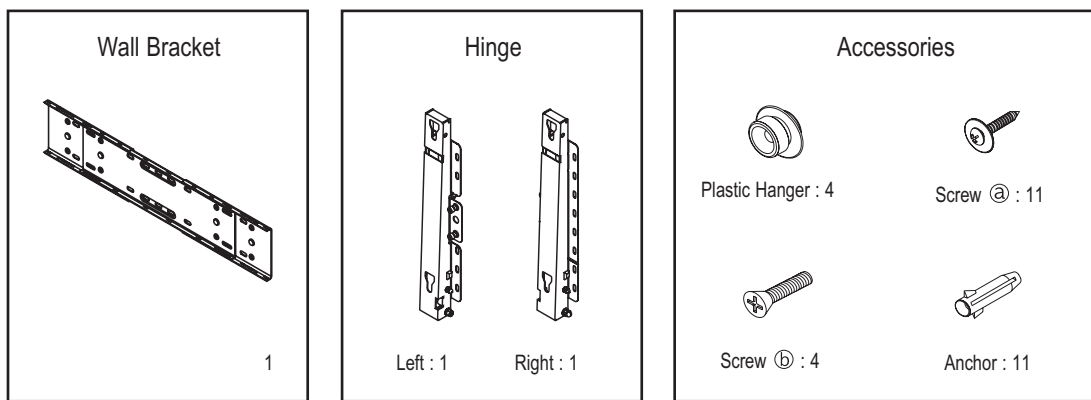
11-3 Installation Notes and Precautions

11-3-1 Installation Notes

1. Contact a technician for installing the wall bracket.
2. Samsung Electronics is not responsible for any damage to the product or injury to yourself or others if you elect to perform the wall installation.
3. This product is for installing on cement walls. The product may not stay in place when installed on plaster or wood.

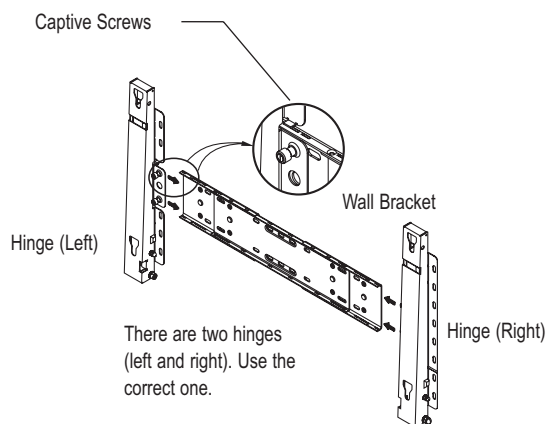
11-3-2 Parts (Wall attachment panel is sold separately)

Only use the components and accessories shipped with the panel.

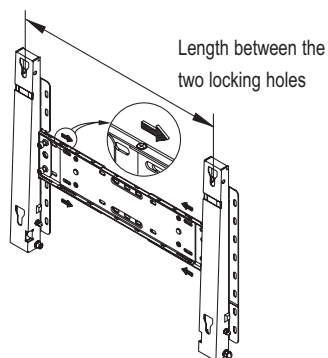


11-3-3 How to assemble the Wall Mount Bracket

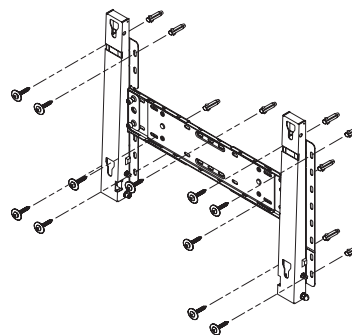
- 1 Insert and tighten the Captive Screw in the direction of the arrow.
When done, mount the wall bracket on the wall.



- 2 Before drilling into the wall, check if the length between the two locking holes at the back of the product is correct.
If the length is too short or long, loosen all or some of the 4 screws on the wall bracket to adjust the length.

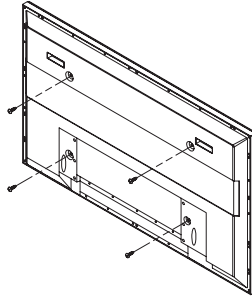


- 3 Check the installation diagram and mark the drill points on the wall.
Use the 5.0 mm bit to drill holes deeper than 35 mm. Fix each anchor in the corresponding hole.
Match each of the brackets and hinge holes to the corresponding anchor holes and insert and tighten the 11 screws ①.

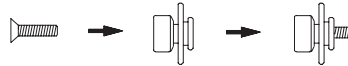


11-3-4 Fixing the TV panel to the wall attachment panel bracket

1 Remove the 4 screws on the back of the product.

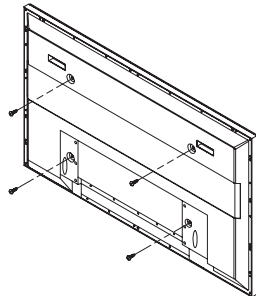


2 Insert the screw ② into the plastic hanger. (See the figure below)

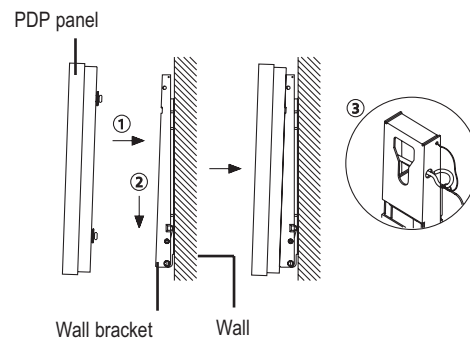


- Mount the product on the wall bracket and make sure it is properly fixed to the left and right plastic hangers.
- Be careful when installing the product on the bracket as fingers can be caught in the holes.
- Make sure the wall bracket is securely fixed to the wall, or the product may not stay in place after installation.

3 Tighten the 4 screws in step 2 (plastic hanger + screw ①) to the rear holes of the product.



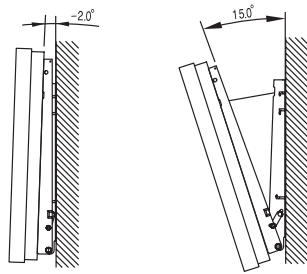
4 Remove safety pin (③) and insert the 4 product holders into the corresponding bracket holes (①). Then place the product (②) so that it is firmly fixed to the bracket. Make sure to reinsert and tighten the safety pin (③) to securely hold the product to the bracket.



11-3-5 How to Adjust Mounting Angle

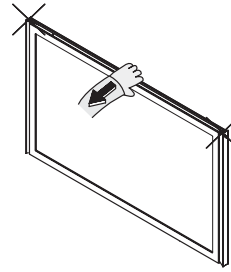
Note : Adjust the bracket angle to -2° before installing it on the wall.

Change Angle



- 1 Fix the product to the wall bracket.
- 2 Hold the product at the top in the center and pull it forward (direction of the arrow) to adjust the angle. (See the figure to the right)
- 3 You can adjust the bracket angle between -2° and 15° .

How to Adjust Mounting Angle



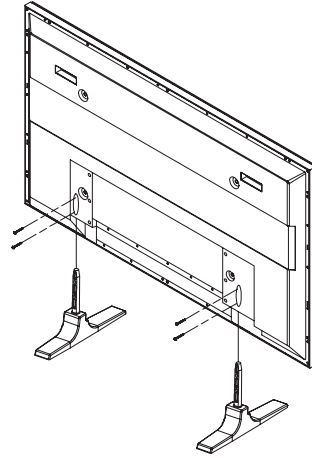
Make sure to use the top center, and not the left or the right side of the product to adjust the angle.

Notes

- Contact an authorized technician when installing the wall attachment panel.
- After hanging the TV panel on the wall attachment panel, make sure that the Insulation holders are completely secured.
- Be careful not to get your fingers caught during installation.
- Make sure the wall attachment panel brackets are tightened. Otherwise, the TV panel may fall down.
- Please secure the mounting bracket on the wall surface after setting its angle at 0° .

11-3-6 How to assemble the Stand-Base

- 1 Assemble the PDP Monitor with the stand and firmly secure the PDP Monitor using 4 screws provided.
- ◆ Two or more people should carry the PDP Monitor. Never lay the PDP Monitor on the floor because of possible damage to the screen. Always store the PDP Monitor upright.

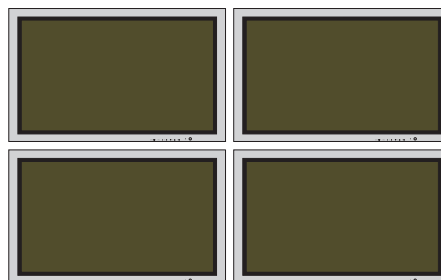


11-4 The other Function

11-4-1 Before Using the Video Wall and the Multiple Display Control function

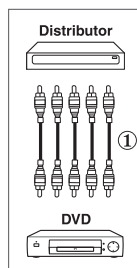
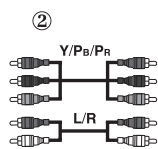
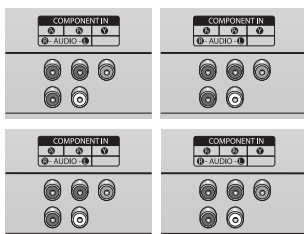
- 1 Please create ID for each PDP Monitor before installing them close together. It may be difficult to create IDs when operating the remote control for PDPs that are installed close to each other.
- 2 For details about Video Wall configuration and operation, refer to "Setting the Multiple Screen" on page 33.

※ Example for 2x2 Video Wall function

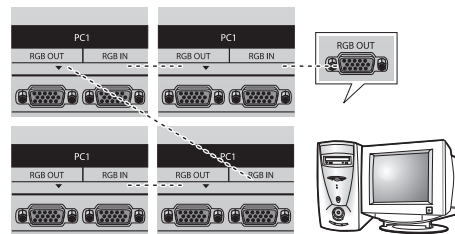


※ Example for 2x2 Video Wall connections

Rear of the PDP Monitor

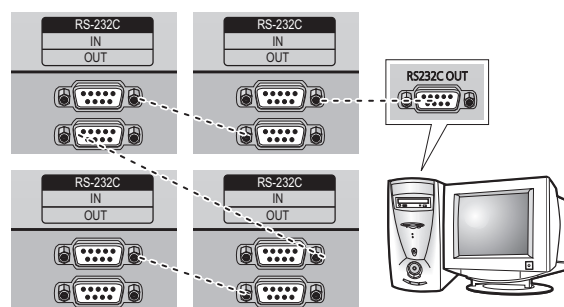


Rear of the PDP Monitor



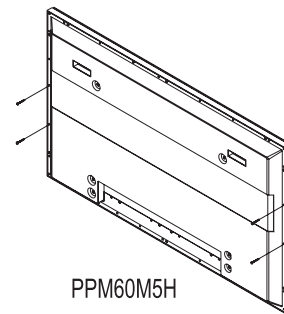
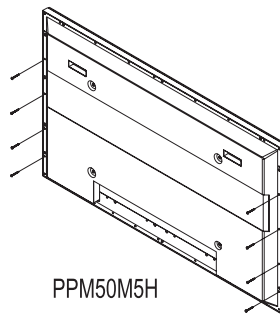
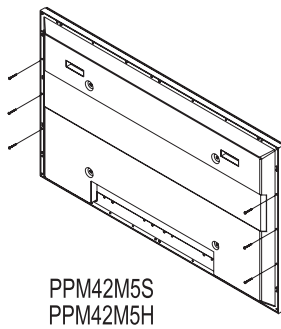
- ◆ You can connect a VCR without a distributor as you would connect a PC.
- ◆ Select ID input on the menu. Use the numeric buttons to enter the ID for PDP Monitor adjustment. You can operate the remote control only for the PDP Monitor that has been selected.
- ◆ For details about Multiple Display Control, refer to "Setting the MDC (Multiple Display Control)" on page 29 and the Help section in MDC program CD.

※ Example for Multiple Display Control connections

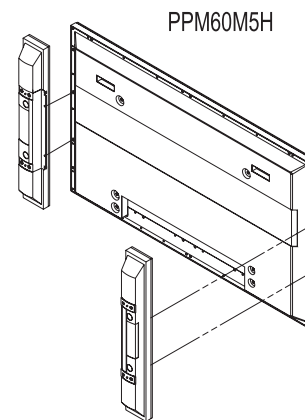
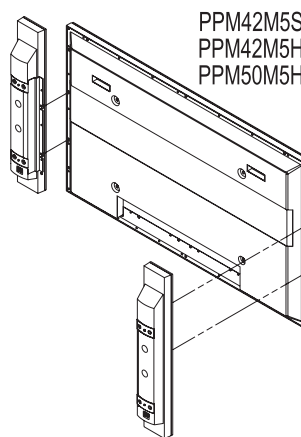


11-4-2 How to Connecting Speakers

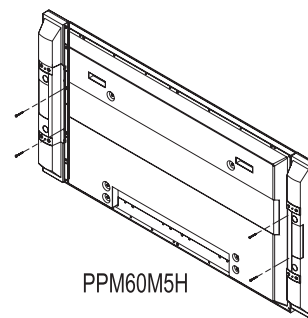
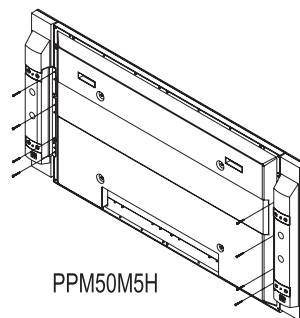
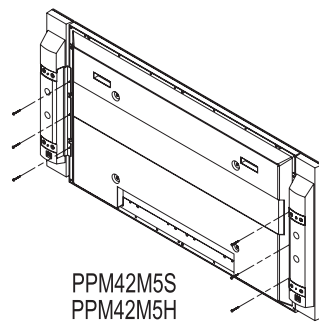
- 1 Remove the screws on the rear of the PDP Monitor.



- 2 Hang the two "T" shaped hangers on the square holes on the rear of the PDP Monitor.

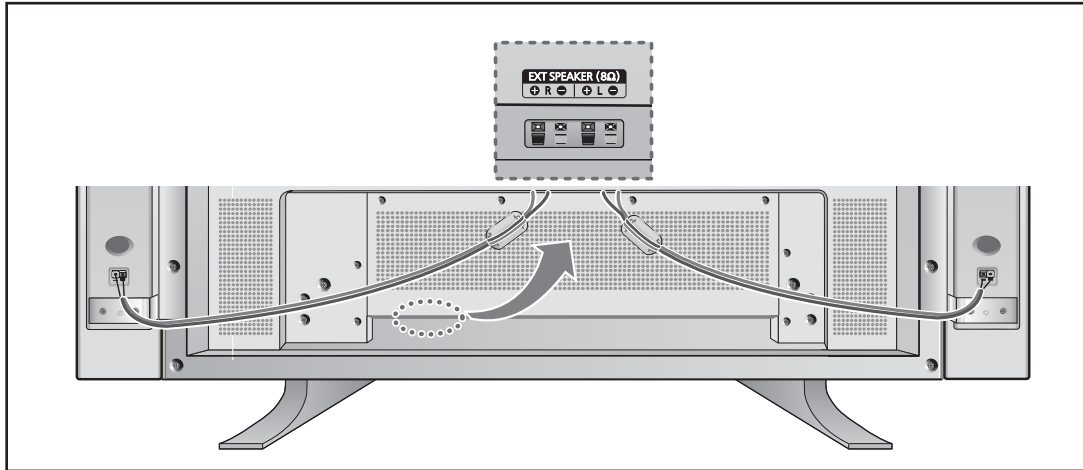


- 3 Tighten the PDP Monitor and the speaker bracket using the screws removed from the PDP Monitor.



ⓘ When moving your PDP Monitor, do NOT hold the speaker connected to your PDP Monitor. It may damage the bracket clamping the speaker and your PDP Monitor together and result in a drop of your PDP Monitor and a risk of personal damage and injury.

Connect the speaker audio cable to the external speaker output jack on the rear of the PDP Monitor matching the “+” and “-” ends of the cable with the diagram on the PDP Monitor.



- ◆ The speakers MUST have to a power handling capability of 10 watts minimum (impedance 8Ω).
- ◆ When you connect the speaker wire to the external speaker out connector, first bind the speaker wire round the ferrite core to secure it.



12. Disassembly & Reassembly

12-1 Overhaul Disassembly & Reassembly



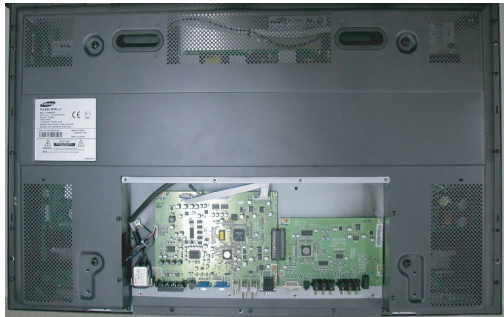
⚠ Caution

- Be sure to separate the power cord before disassembling the unit.
- Discharge the capacitors first when separating PCB's with high capacity capacitors such as SMPS, X Drive Board, Y Drive Board, etc. (Sparks may be generated by an electric charge, and there is a danger of electronic shock.)
- Check that the cables are properly connected referring to the circuit diagram, when disassembling or assembling the unit and take care not to damage the cables.
- Take care not to damage the Glass Filter at the front.
- Assemble the boards in the reverse order of the disassembly.

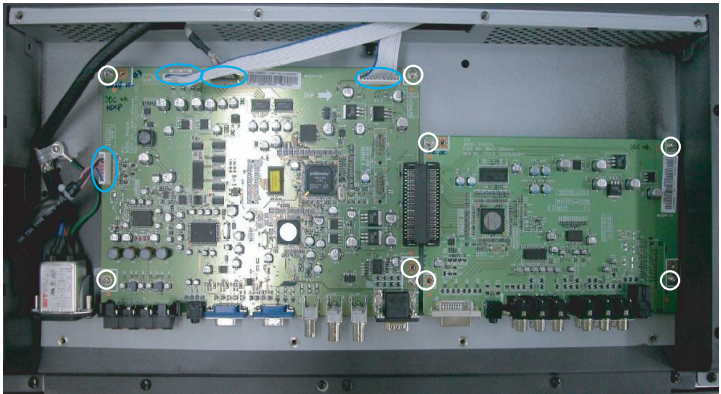
12-1-1 Separation of Stand

Part Name	Description	Description Photo
Stand	<p>① Place the unit down and remove the 4 screws to separate the stand. : BH,+,S,M4,L35,ZPC(BLK) 6009-001432</p> <p>⚠ Caution: Take care not to damage the front glass when placing the unit down.</p>	
	<p>② Loosen and remove the screws and Stand remove.</p>	

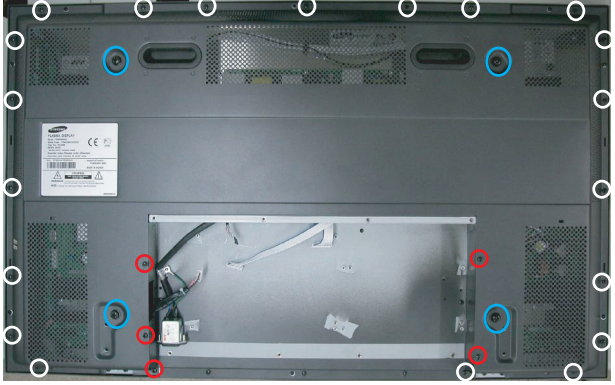
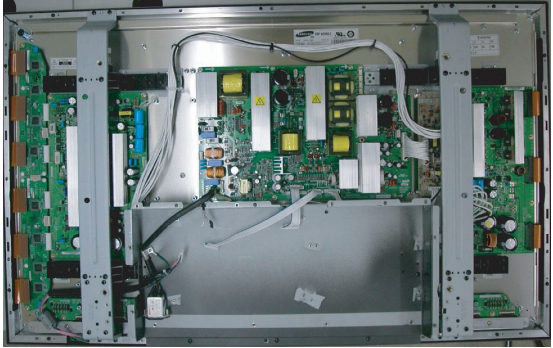
12-1-2 Separation of Sub Cover Back

Part Name	Description	Description Photo
Sub Cover Back	① Loosen and remove the 8 screws. : BH,+,S,M4,L8,ZPC(BLK),SWRCH18A 6003-000133	
	② Loosen and remove the 4 screws. : M3,L6,NI PLT,SUM24L,#4-40 6046-001010	
	③ Loosen and remove the screws and remove the Sub Cover.	

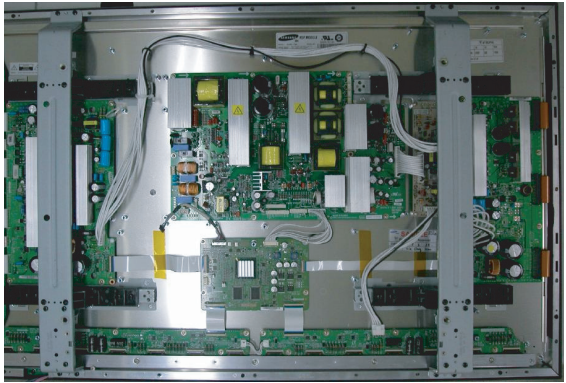
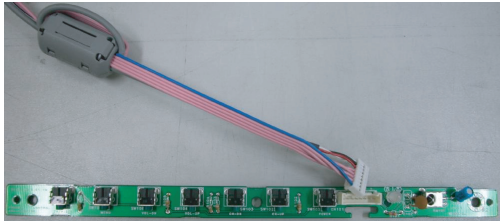
12-1-3 Separation of Video Board

Part Name	Description	Description Photo
Video Board	① Separate the cables connected to the Digital Board and remove the 8 screws. : FH,+,M3,L10,NI PLT,SWRCH18A,FP 6001-000321	

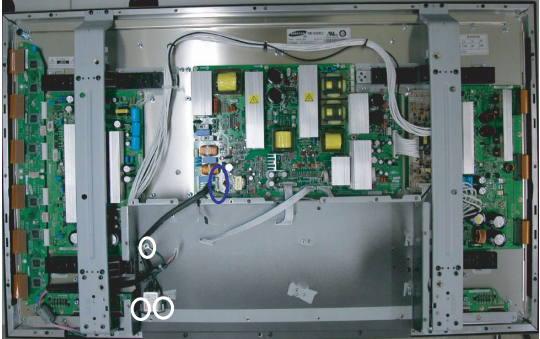
12-1-4 Separation of Back Cover

Part Name	Description	Description Photo
Back Cover	① Remove all marked screws : Blue(4EA) M8,L16,ZPC(BLK),SWRCH18A,WP 6006-001112 Red (5EA) BH,+,S,M4,L8,ZPC(BLK),SWRCH18A 6003-000133 White (20EA) BH,+,S,M4,L16,ZPC(BLK),SWRCH18A 6002-001294	
	② Take care not to damage the back cover when removing it.	

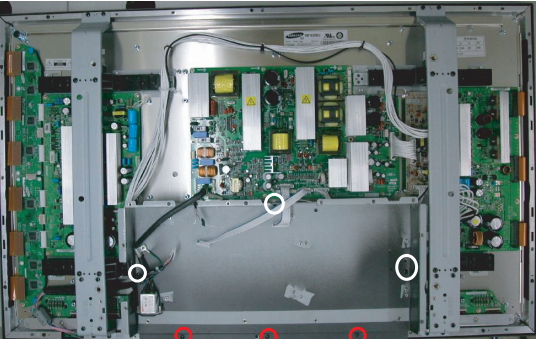
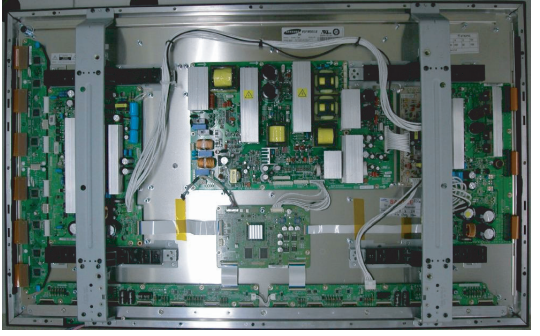
12-1-5 Separation of Key/Remocon

Part Name	Description	Description Photo
Key /Remocon	① The Function Key Board can be separated after separating the module.	
	② Loosen and remove the 3 screws. : .BH,+,S,M4,L8,ZPC(BLK),SWRCH18A 6003-000133	

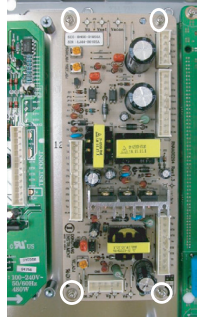
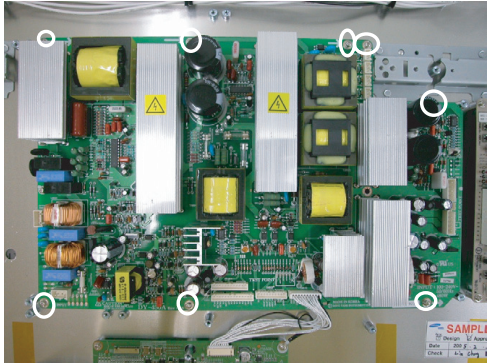
12-1-6 Separation of Inlet Socket

Part Name	Description	Description Photo
Inlet Socket	① Loosen and remove the 3 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321	

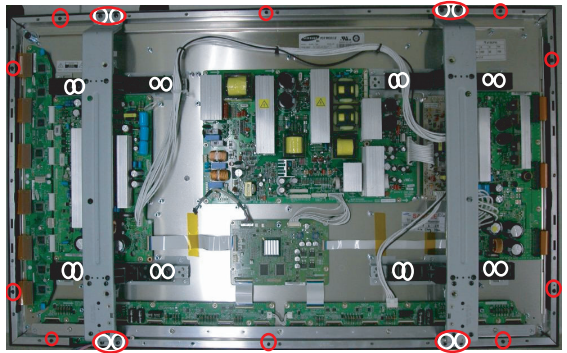
12-1-7 Separation of Sub Back

Part Name	Description	Description Photo
Sub Back	① Loosen and remove the 6 screws. White BH,+,S,M4,L8,ZPC(BLK),SWRCH18A 6003-000133 Red BH,+,S,M4,L16,ZPC(BLK),SWRCH18A 6002-001294	
	② Remove the Sub Back.	

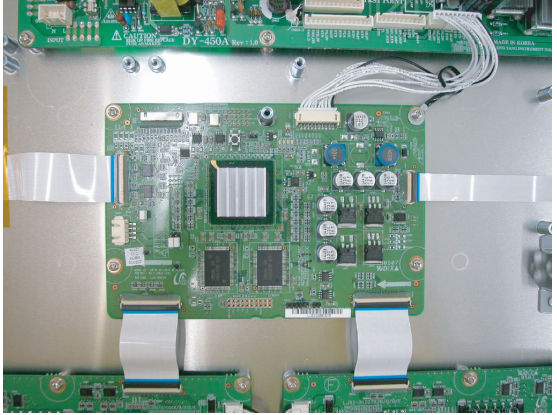


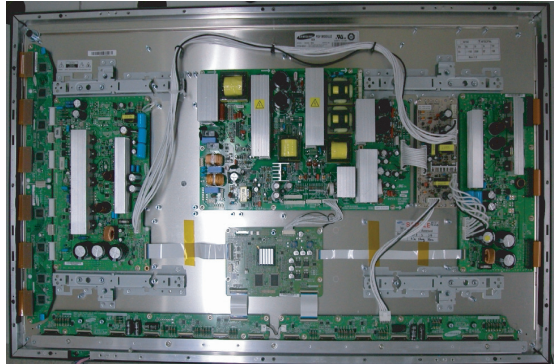
12-1-8 Separation of DCDC SMPS, Main SMPS

Part Name	Description	Description Photo
DCDC SMPS	<p>① Separate the cables connected to the DC-DC SMPS and then remove the 4 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321</p>	
Main SMPS	<p>② Separate the cables connected to the Main SMPS first and then remove the 8 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321</p>	

12-1-9 Separation of Separating Pillar/Module

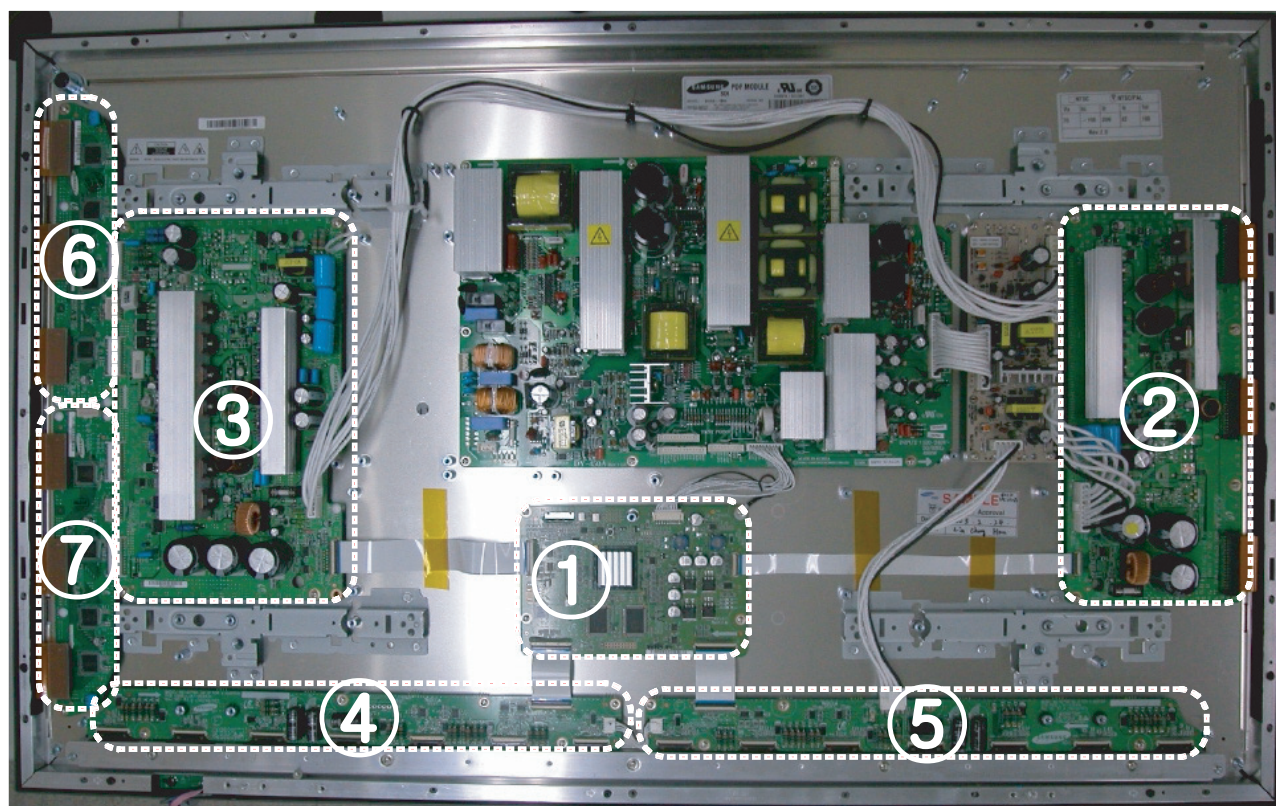
Part Name	Description	Description Photo
Separating Pillar/Module	<p>① Remove the red screws to separate the module. : BH,+,S,M4,L16,ZPC(BLK),SWRCH18A 6002-001294</p> <p>Remove the white screws to separate the pillar. : BH,+,S,M4,L8,ZPC(BLK),SWRCH18A 6003-000133</p>	

12-1-10 Separation of Board

Part Name	Description	Description Photo
Logic Board	① Separate the cables connected to the Logic Board and then remove the 4 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321	
X Drive Board	① Separate the cables connected to the X Drive Board and remove the 4 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321	
Y Drive Board	① Separate the cables connected to the Y Drive Board and remove the 4 screws. : FH,+,M3,L10,NI PLT,SWRCH 18A,FP 6001-000321	
Y Buffer Board , Address Buffer Board	① Separate the Y Buffer Board and the Address Buffer Board depending on the problem.	

13. Circuit Description

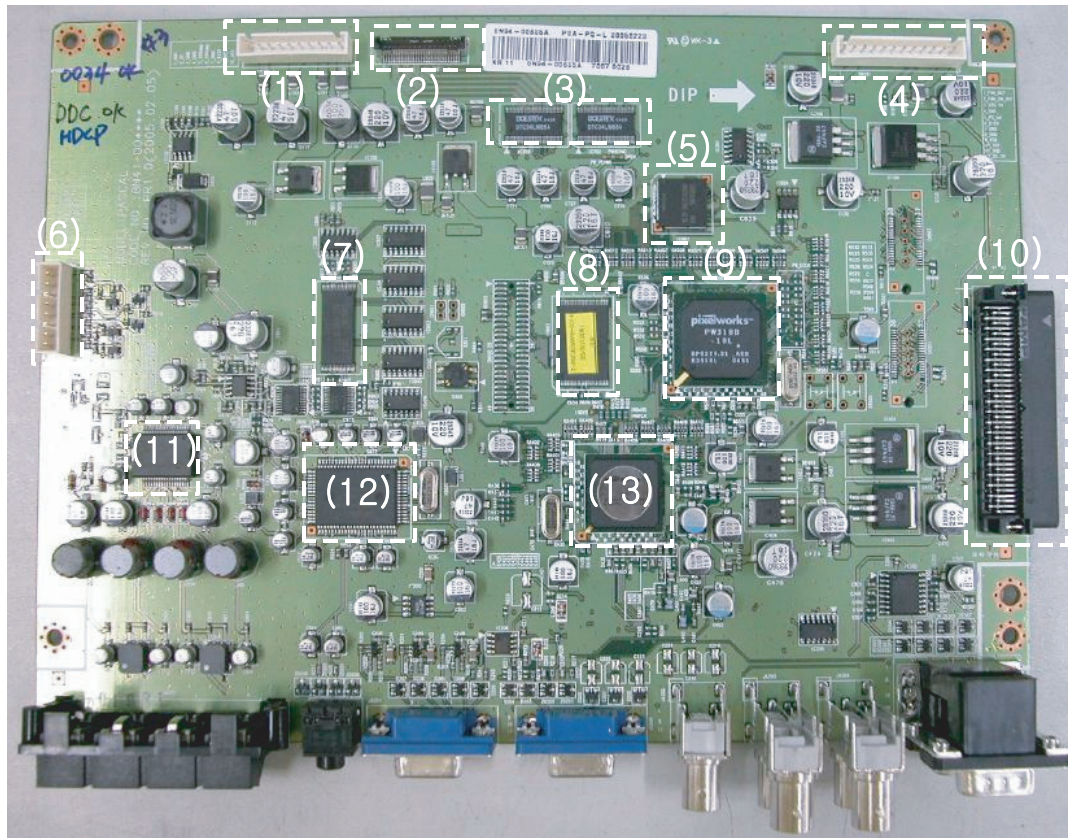
13-1 Overall Block Description



- ① ASSY PDP P-LOGIC BOARD(BN94-00696A)
- ② ASSY PDP P-X MAIN BOARD(BN96-02038A)
- ③ ASSY PDP P-Y MAIN BOARD(BN96-02039A)
- ④ ASSY PDP P-E ADDRESS BUFFER BOARD(BN96-02043A)
- ⑤ ASSY PDP P-F ADDRESS BUFFER BOARD(BN96-02044A)
- ⑥ ASSY PDP P-Y BUFF UPPER BOARD(BN96-02040A)
- ⑦ ASSY PDP P-Y BUFF LOWER BOARD(BN96-02041A)

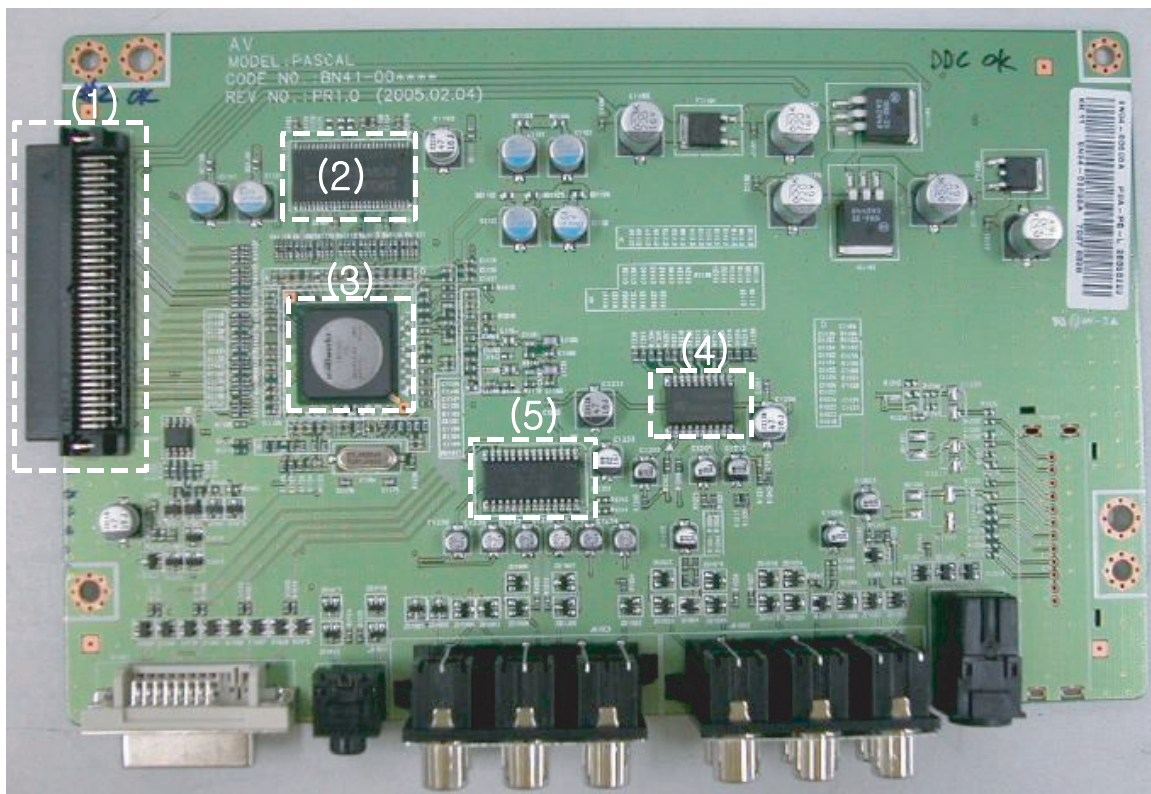
13-2 Partial Block Description

13-2-1 Digital Board



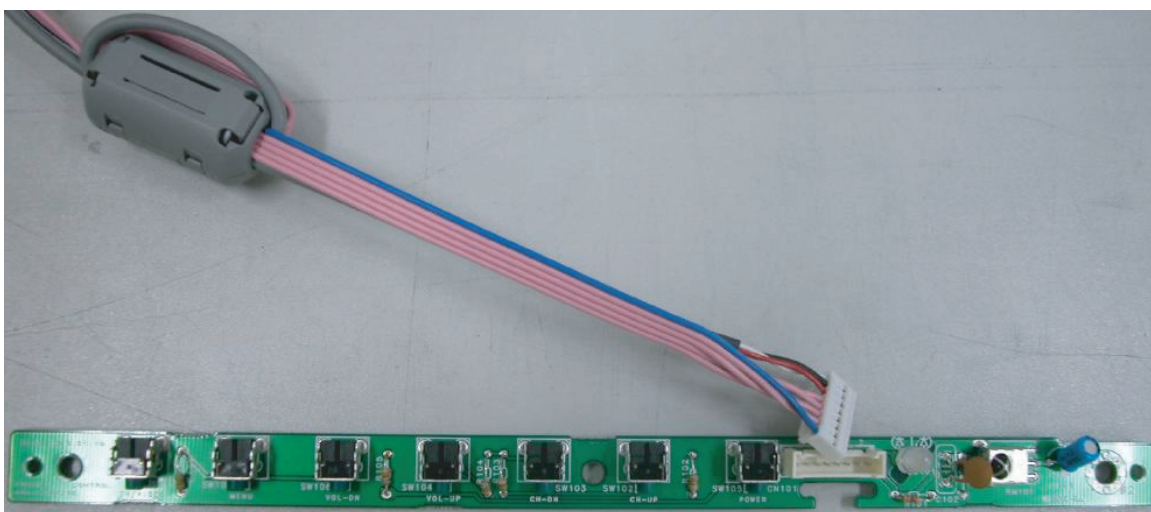
- ① CN100(10P) : Receives power from the SMPS
- ② CN700(31P) : Transmits the LVDS signal to the PDP Logic Board
- ③ IC700, IC702(DTC34LM85A) : The LVDS Transmitter IC. This converts the DTV video signal into a LVDS signal and transmits the signal to PDP Logic Board.
- ④ CN101(12P) : Receives power from the SMPS
- ⑤ IC601(K4D263238E) : DDR Memory
- ⑥ CN500(8P) : Receives the signal from the Function keys
- ⑦ IC901(K6X1008C2D) : Sound Delay IC
- ⑧ IC603(Flash Memory) : Flash memory for operating IC PW318. The date of the software is printed on the label on the IC.
- ⑨ IC500(PW318) : A Scaler IC that generates the output resolution appropriate to the PDP panel and generates the PIP screen.
- ⑩ CN300(80P) : Connected to the AV board, Male
- ⑪ IC800(TA2024) : Sound AMP IC
- ⑫ IC802(MSP3425G) : Sound Processing IC
- IC400(PW2250) : Video Decoder

13-2-2 A/V Board



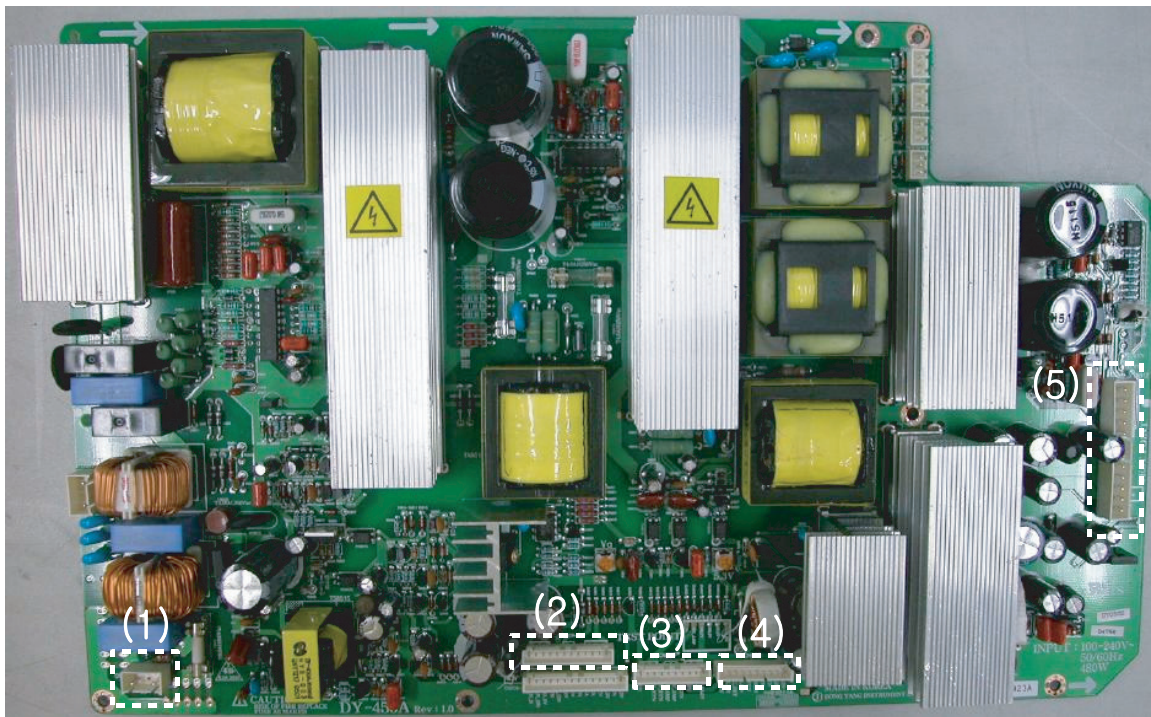
- ① CN1200(80P) : Connected to the PC board, Female
- ② IC1101(K4S641632C) : PW3300 SDRAM
- ③ IC1100(PW3300) : Video Decoder, TMD5
- ④ IC1200(TEA6425) : AV Signal(CVBS), S-VHS Video Signal Switching IC
- ⑤ IC1201(TEA6422) : Audio input Switching IC

13-2-3 Function Key Board



Function Key. Located on the left bottom of the unit.

13-2-4 Main SMPS



(1) CN800: AC IN (90 ~ 264V)

※ CN804-1, CN806, CN807, CN808, CN811 are not used.

(2) CN804-1 (MAIN SMPS) ↔ CN101(PC B'D)		(3) CN803(MAIN SMPS) ↔ CN108(READY B'D)		(4) CN810(Main SMPS) ↔ CN2013(Logic B'D)		(5) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal	Pin No	Signal	Pin No	Signal	Pin No	Signal
1	FAN-D	1	RTN	1	5.3V	1	5.3V
2	FAN-ON	2	VT(33V)	2	5.3V	2	Vg
3	STD_5V	3	RTN_AMP	3	RTN	3	RTN
4	GND	4	RTN_AMP	4	RTN	4	RTN
5	PS-ON	5	18V_AMP	5	5.3V	5	RTN
6	D12V	6	18V_AMP	6	RTN	6	RTN
7	GND	7	RTN	7	PS-ON	7	RTN
8	GND	8	12V	8	N.C	8	Va
9	VCA	9	RTN	9	VS-ON	9	Va
10	VCS	10	6V	10	STB 5V	10	N.C
11	GND					11	Vs
12	D5.3V					12	Vs

1. Outline (PDP 42inch/50inch SMPS)

Considering various related conditions, the switching regulator with good efficiency and allowing for its small size and light weight was used as the power supply for PDP 42inch(Schubert)/50inch(Strauss), VS requiring high power consumption Asymmetrical Half Bridge converter and flyback converter. To comply with the international harmonics standards and improve the power factor, active PFC(Power Factor Correction) was used to rectify AC input into +400V DC output, which in turns used as input to the switching regulator.

2. Input

The power supply shall be capable of supplying full rated output power over free voltage ranges that are rated 100 VAC - 240 VAC RMS nominal. Operating voltage : 90 VAC - 264 VAC

The power supply must be able to start up under peak loading at 90V AC. The power supply shall automatically recover from AC power loss. (Note that nominal voltages for test purposes are considered to be with +/- 1.0V of nominal).

STD_5V & Vpr2(3.3V) is a SELV standby voltage that is always present when AC mains voltage present.

3. Output

Output Name	Output Voltage	Output Current(Max.)	Using in PDP Driving
VS	+190V ~ 220V (210V)	2.0A	Sustain Voltage of Drive Board
VA	+60V ~ 80V (70V)	3.0A	Address Voltage of Drive Board
D5.3V	+5.3V	5.0A	
A6.5V	+6.5V	3.0A	
FAN_9V	+9V	0.2A	
VG	+15V	1.0A	
D12V	+12V	1.5A	
A12V	+5.3V	0.5A	
18VAMP	+18V	2.5A	Amp Voltage of Audio Board
VT	+33V	0.006A	
STD_5V	+5V	1.0A	Standby for Remote Control

4. Over Voltage Protection

The over voltage sense circuitry and reference shall reside in package that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any of all outputs.

The supply shall provide latch-mode Over Voltage Protection as defined below.

Parameter	Min	Unit
VS(210V)	250 ~	V
VA(70V)	100 ~	V
VCC(+5.3V)	6.8 ~	V

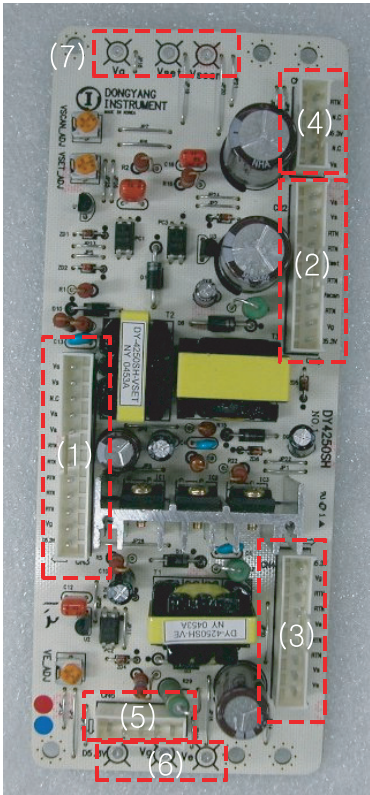
5. Short Circuit and Over current Protection

An output short circuit is defined as output impedance of less than 300mohms. The power supply shall shutdown and latch off for shorting VS DC rails to return. Shorts between main output rails and STD_5V shall not cause any damages to the power supply.

The power supply shall either shutdown and latch off for shorting is removed, the P/S shall recover. The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or over stress to the unit (components, PCB traces,connectors,etc.) under the input conditions specified in Section 3 above. Current Protection as defined below.

Output	Over Current Limit	Unit
VS(210V)	20A, Constant Current.(TBD)	A
VA(70V)	10A, Constant Current.(TBD)	A
Output except Vs,Va	No damage (Auto Recovery or Shut down.)	A

13-2-5 DC-DC SMPS



(1) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

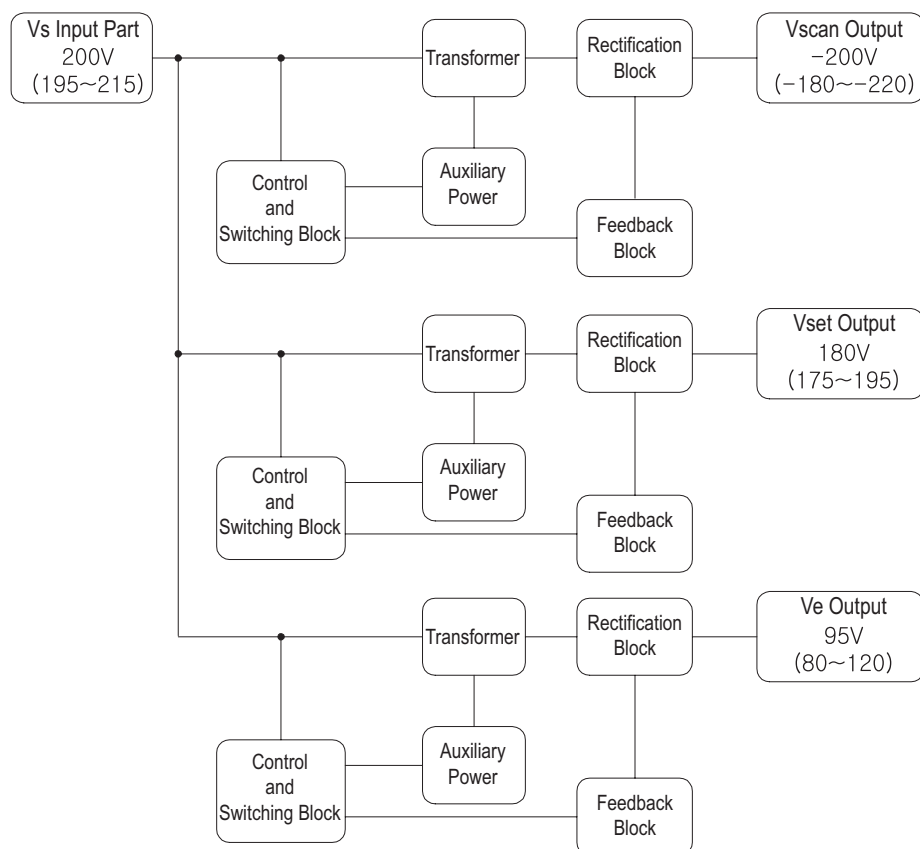
(4), (5) CN1, CN6 (DC-DC SMPS) ↔ CN2501(E-Buffer), CN2701(G-Buffer)	
Pin No	Signal
1 ■	RTN
2	N.C
3	5.3V
4	N.C
5	Va

(2) CN2(DC-DC SMPS) ↔ CN5007(Y B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Vset
6	RTN
7	Vscan
8	RTN
9	Vg
10	5.3V

(3) CN4(DC-DC SMPS) ↔ CN4000(X B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Ve
6	RTN
7	RTN
8	Vg
9	5.3V

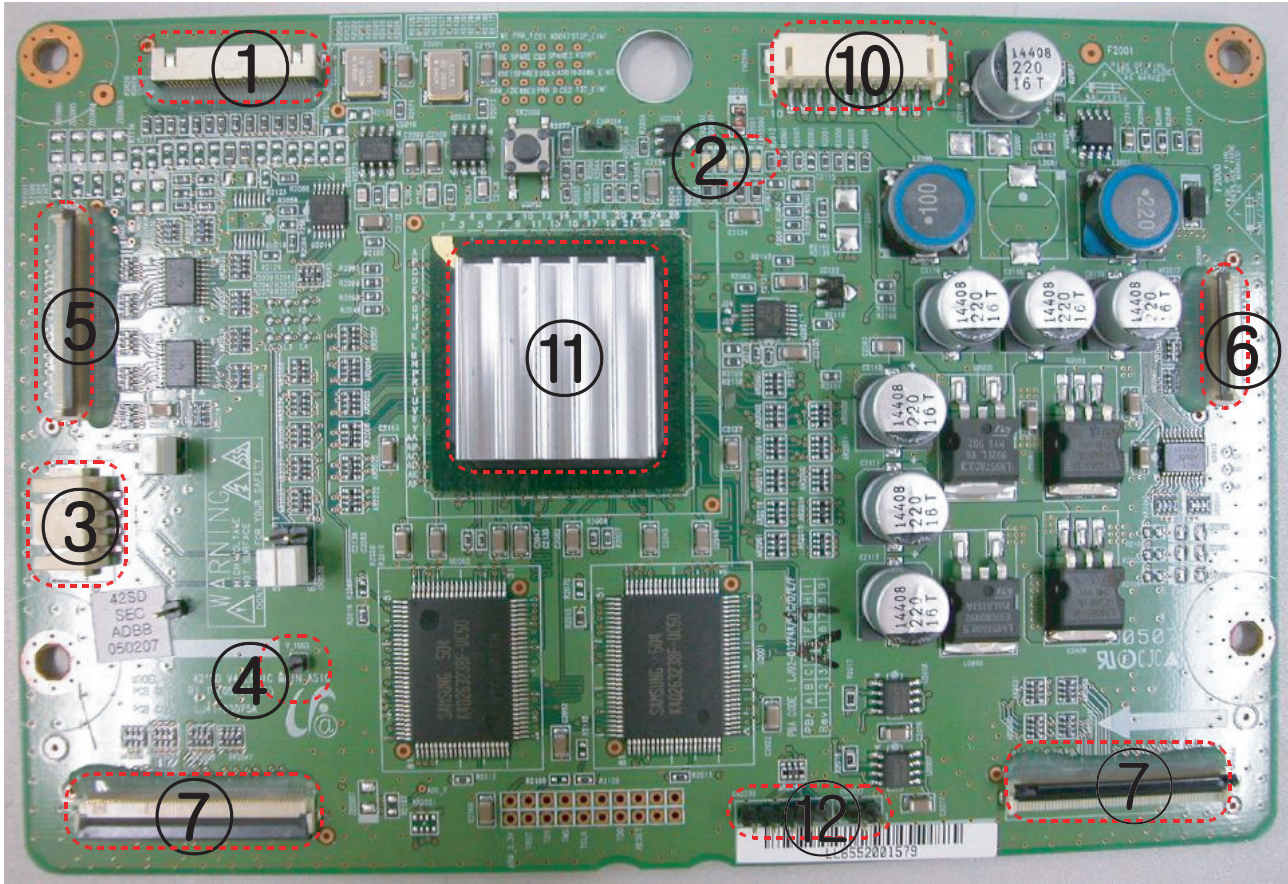
(6) D5.3V, Vg, Ve Test Point
(7) Va, Vset, Vscan Test Point

1. Block Diagram



DC DC SMPS receives Vs input (195~215V) from the Main SMPS and the necessary Vscan, Vset and Ve voltages are output to operate the PDP Module as shown in the block diagram above.

13-2-6 Logic Board



Item	Name	Explanation
①	LVDS Connector	The connector to receive the RGB, H, V, DATAEN and DCLK signals that have been LVDS encoded through the video board. At present, there are 2 LVDS, both internal and external, and only LVDS will be provided in the final version of the board.
②	Operating Status LED	The LED that shows whether the Sync and Clock signal is properly supplied to the logic board (Normal Status: Blinks at 1 second intervals)
③	I2C Connector	The connector for the Key Scan board that checks and controls the 512K data.
④	V-TOGG	V-SYNC Output Pin
⑤	Y Connector	The connector to output the control signal for the Y drive board.
⑥	X Connector	The connector to output the control signal for the X drive board.
⑦	CN2001,CN2002	The bottom E,F-The connector to output the address data and the control signal to the E-buffer board.
⑩	Power Connector	The connector to receive power (5V, 3.3V) for the Logic board.
⑪	ASIC CHIP	The main processor that generates and outputs the logic drive signal and the address data.
⑫	MICOM LOADING 5PIN CONNECTOR	The connector to load the Micom drive program. The program is loaded by connecting to the GA-WRITER.

■ About Logic Board

The Logic Board consists of a Logic Main board, which processes the video signal input through LVDS and creates the address driver output and XY drive signals, and a Buffer board, which buffers the output signal and outputs the signal to the Address Driver IC (TCP IC).

Logic Board		Function	Remark
Logic Main		- Video Signal Processing (W/L, error diffusion, APC) - Outputs the Address Driver Control and Data Signals to the Buffer board. - Outputs the XY Drive Board Control Signal	
Buffer Board	E Buffer Board	Outputs data and control signals to the bottom left TCP IC.	
	F Buffer Board	Outputs data and control signals to the bottom right TCP IC.	

Major Check Points and Waveforms

- The waveform during a Normal Operation

When the PDP set and the Logic Board are properly operating, the Operation Status LED blinks at approximately 0.8 second interval as shown in Figure 1.

If the set is out of order, check the Operation Status LED first, and check that the output waveform is normal using an oscilloscope.

Check if the waveform is the same as shown in Figure 2 by connecting the oscilloscope to the No. 12 TP in Figure 1. Check if the waveform is the same as in Figure 3 by connecting the oscilloscope to the connector that is connected to the Buffer board.

If the measured waveform is different from the following waveforms, the board must be replaced.

To check the waveforms, refer to the following waveform patterns.

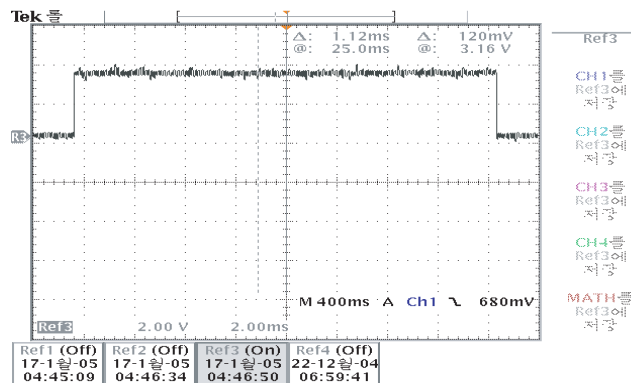


Figure 2. Normal V-SYNC Output Waveform

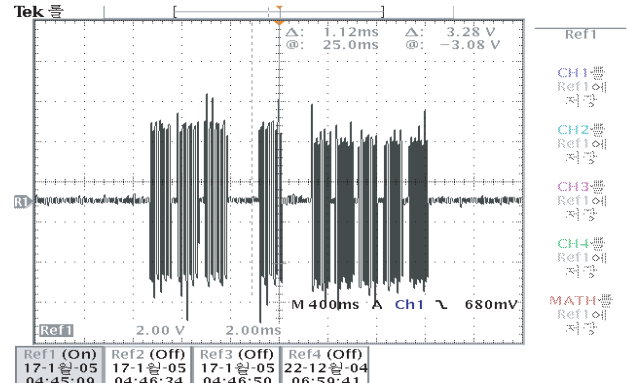
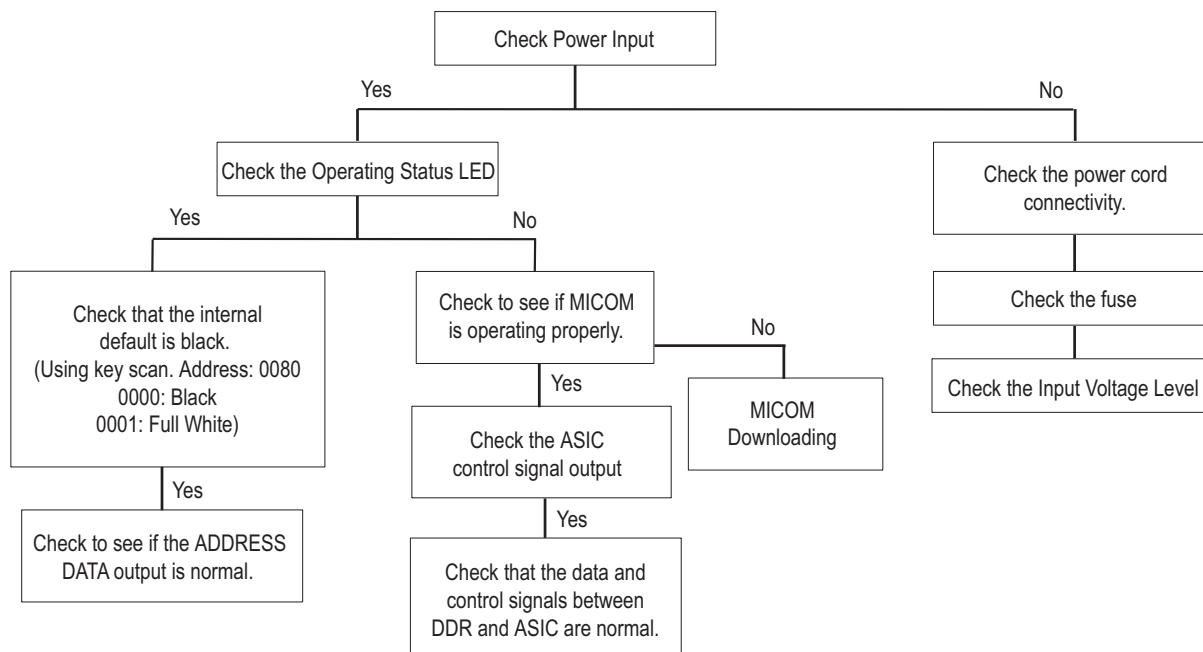


Figure 3. Normal Address Data Output Waveform

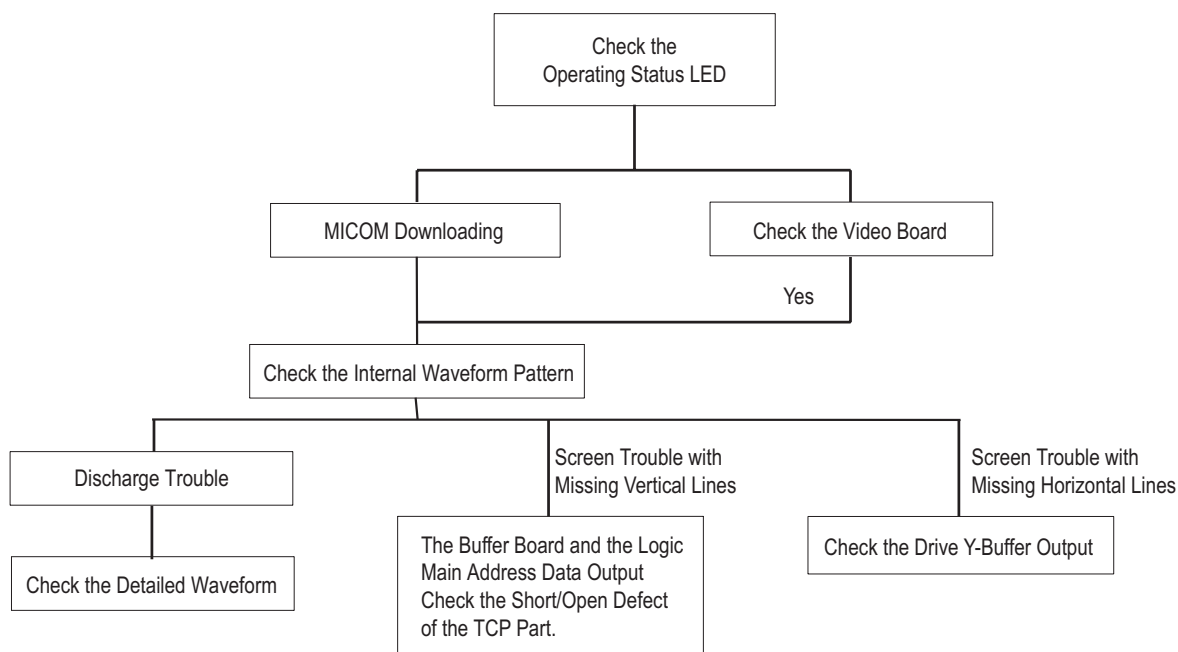
■ Troubleshooting

There are various problems caused by the Logic Board and these have been classified by the Flow Chart.

- No picture on the screen



- Screen Error



1. X, Y Control Block

■ Drive Circuit Definition

The Drive Circuit is a circuit that generates a waveform (high-voltage pulse) for the X and Y electrode group of the panel's external port so as to control the panel. The high-voltage switching pulse is generated through the combination of the IC HYBRID (Drive block + IGBT) and FET.

■ Drive Circuit Mechanism

A picture is displayed on the PDP by applying voltage to the X, Y and ADDRESS electrodes of each pixel according to the appropriate condition. The drive waveform applied to 42HD V4 is of the ISSS (ISSS: Interweaving Scan and Selective Sustain with Scan IC) type and has IDS (InDependent Sustain) in the Scan section unlike the existing ADS. Discharges within a PDP pixel can be classified into 3 types:

- ① Address Discharge: To form a wall voltage within the pixel by giving information (applying DATA voltage) to the pixel to be lit.
- ② Sustain Discharge: Sustain Discharge is a display section that voluntarily maintains the discharge of the pixels whose wall voltage has been formed by the Address Discharge. (Optical output for displaying a picture is generated).
- ③ Erase Discharge: To selectively perform Address Discharge for each pixel, all pixels on the panel should be in the same status (the wall electric charge status and space electric charge status must be the same). Therefore, the Erase Discharge section is an important component for guaranteeing the drive margin, and is implemented by various methods such as applying a log waveform. However, the current 42HD V4 has adopted a wall voltage control through an RA (Repeated Auto-quenching) reset that separates the discharge area and performs switching to perform an efficient erase operation, while the gradient was the same in the RAMP section in the existing approach.

1) Address Discharge

A discharge that is caused by the difference between the plus electric potential (V_a apply voltage of 65~70V + Positive Wall Charge) of the electrode and the negative electric potential (Applied GND Level + Negative Wall Charge) of the Y electrode. The Address discharge forms a wall voltage within the pixel to display color (to be discharged) before the Sustain Discharge period. That is, the pixel whose wall charge has been formed by the Address Discharge forms a Sustain Discharge via the following Sustain pulse.

2) Sustain Discharge

A Sustain Discharge is a Self-Sustaining Discharge formed by the accumulation of the electric potential of the Sustain pulse (generally 200 ~ 210 Volt) alternating over the X and Y electrodes during the sustain period, and the wall charge depending on whether the pixel has previously been discharged or not. That is, it is controlled by the memory characteristics, one of the basic characteristics of the AC PDP (in that the past operating conditions determine the current status). That is, if a wall voltage exists on the pixel (if the pixel is on), a discharge is formed again because the applied voltage, which is the sum of the following applied Sustain voltage and the wall voltage, is higher than the discharge threshold voltage. If no wall voltage exists on the pixel (if the pixel is off), a discharge will not occur because the Sustain voltage is not higher than the discharge threshold voltage. The Sustain Discharge period is the period for generating actual optical output so as to display a picture on the PDP screen.

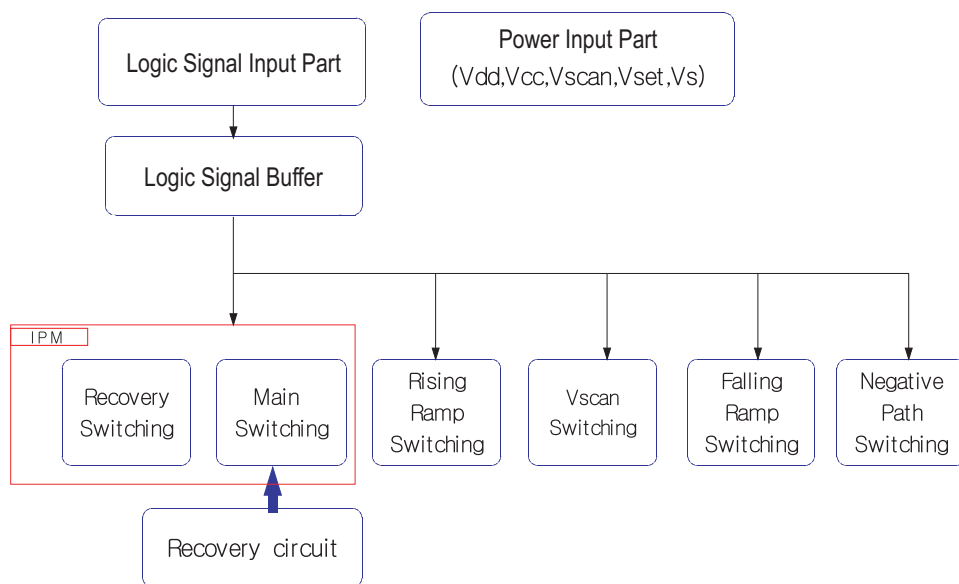
3) Erase Discharge

The purpose of a Reset (Erase) Discharge is to create uniformity of the wall voltage within all panel pixels. It evens the wall voltages regardless of the Sustain Discharge in the previous stage. The Erase Discharge has to remove the wall voltage introduced by the Sustain Discharge by supplying ions or electrons by a discharge. When the wall voltage is removed through a discharge, the time when the reverse polarity is applied to the wall voltage (fine width erasing) is to be limited or ions or electrons are to be supplied by a weak discharge (low voltage erasing) so as to prevent a wall charge in reverse polarity.

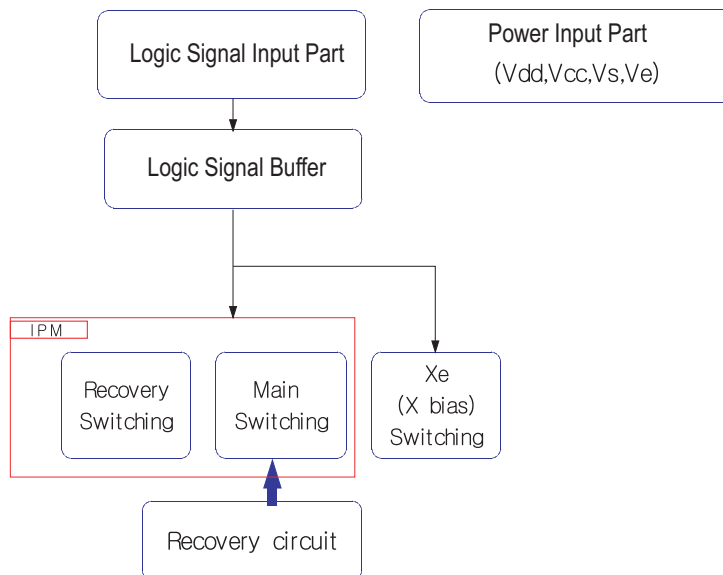
There are 2 known weak discharge (low-voltage) erase methods. 1) A log waveform adopted by F company and 2) a weak erase discharge via a ramp waveform adopted by Matsushita and other companies. Both methods control the externally applied voltage by the difference of the wall voltage of the pixel by applying the rising gradient of the erasing waveform slowly, because the discharge begins when the sum of the existing remaining wall voltage and the rising waveform voltage exceeds the drive threshold voltage. In addition, a weak discharge is introduced, because the applied voltage is low.

■ Drive Circuit Operating Block Diagram

- Y Drive Board



- X Drive Board



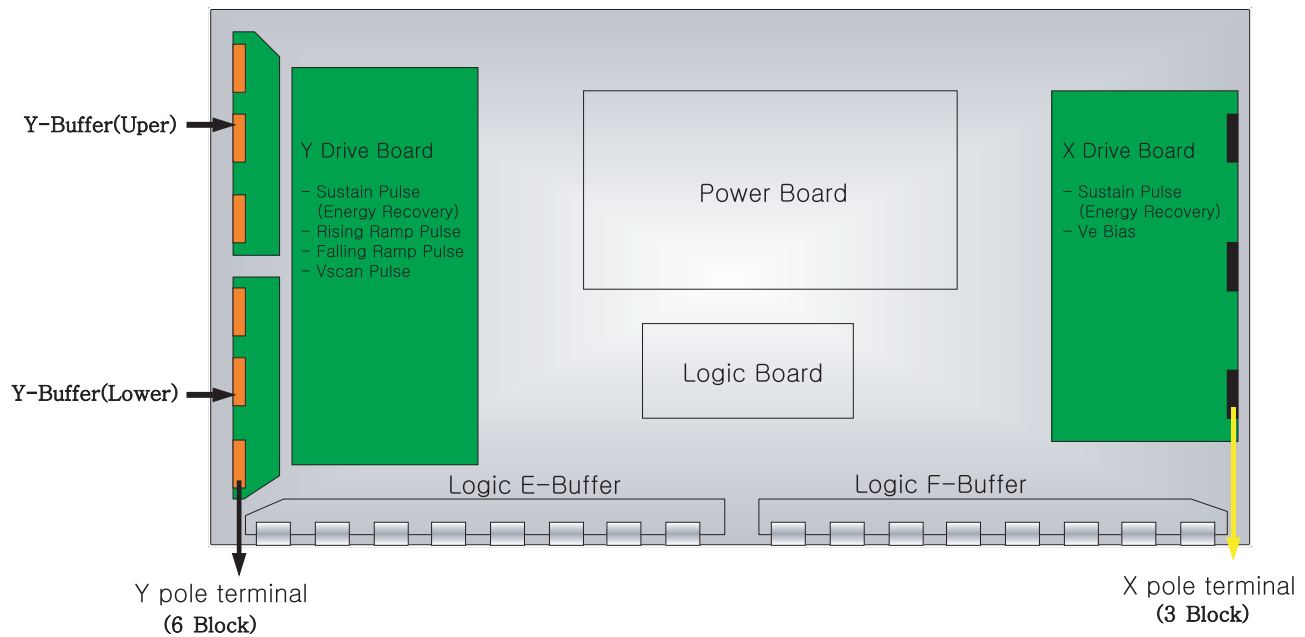
■ Requisite Components Necessary for Drive Board Operation

- Power : Supplied from the power board. The optimal value may differ from the following:
 - V_s : 205V - Sustain
 - V_{set} : 195V - Y Rising Ramp
 - V_e : 100V - V_e bias
 - V_{scan} : -190V - Scan low bias
 - V_{nf} : -175V - Y falling Ramp (Created by the DC-DC power block of the Y Drive board)
 - V_{sc_h} : -70V - Scan high bias (Created by the DC-DC power block of the Y Drive board)
 - V_{dd} : 5V - Logic signal buffer IC and IPM
 - V_{cc} : 15V - Gate drive IC 1× IPM

- Logic Signal : Supplied by the Logic board. Gate signal of each switch

■ Drive Circuit Architecture and Function Description

- Description of the function of each board



1) X Drive Board

This is connected to the X port part of the panel. 1) Sustain voltage waveform (including ERC) is output, and 2) Ve bias in the Scan section is maintained.

2) Y Drive Board

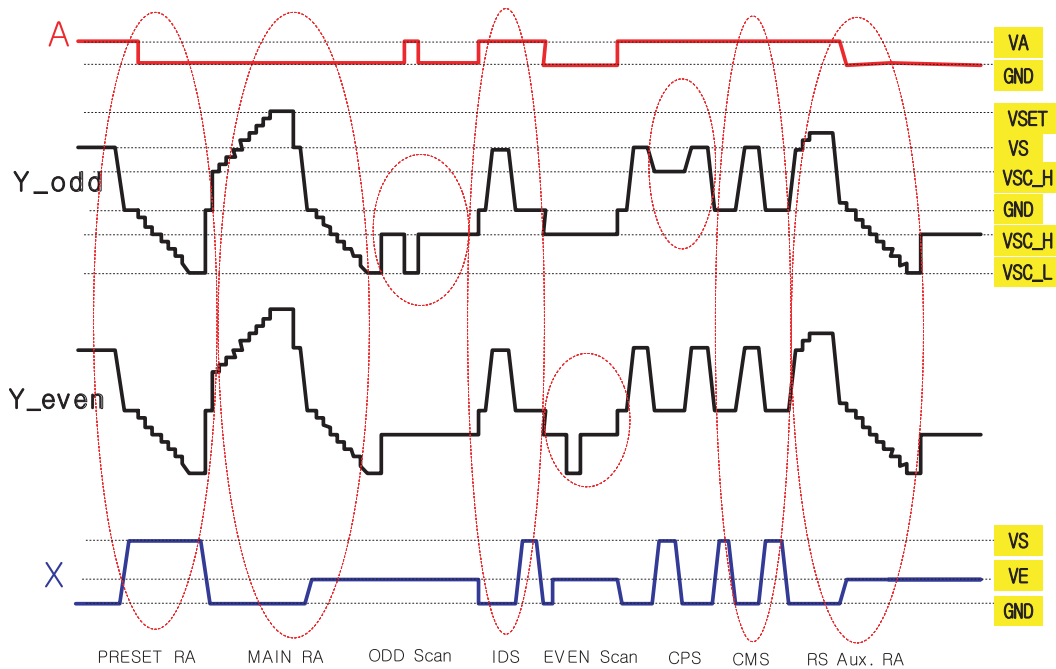
This is connected to the Y port part of the panel. It outputs 1) Sustain voltage wave form (including ERC), and 2) Y Rising, Falling Ramp waveform, and maintains 3) Vscan bias.

3) Y Buffer Board (Upper, Lower)

This board supplies the Scan waveform to the Y port and consists of Upper and Lower boards. For an HD grade unit, 6 scan driver ICs (TEXAS INSTRUMENT SN755867APZP: 64 outputs) are mounted on the board.

■ Drive Waveform Specifications

- Drive Waveform



- Description of the function of each pulse

1) Y Preset RA Pulse

This is supplied to the first sub-field and erases the discharge status of the previous subfield.

2) Y Main RA Pulse

During the Y Rising Ramp section, approximately 300V~350V ($V_{scan-h} + V_{set}$) of external voltage is supplied to the Y electrode, and a weak discharge is started when each gap voltage is equal to the discharge start voltage. While maintaining the weak discharge, as a whole, negative wall charges are accumulated on the Y electrode and positive wall charges on the X electrode and the address electrode.

During the Y Falling Ramp section, the negative wall charges accumulated on the Y electrode by the approximately 105V of X bias are used to erase the positive wall charges on the X electrode, and the address electrode maintains most of the positive wall charges accumulated during the (0V) Rising Ramp section preparing for the next address discharge.

3) Y Scan Pulse (Odd/Even)

A scan pulse classifies the Y electrode into Odd and Even lines and selects FPC output electrodes sequentially (one line-at-a-time). At this time, V_{scan} is called the Scan Bias Voltage.

A V_{scan} voltage of approximately -175 Volt (V_{sc-1}) is supplied to the electrode lines. For the other lines, -56 volt (V_{sc-h} is higher than V_{sc-l} by 120V) is supplied. However, negative wall charges are accumulated on the Y electrode by the Ramp pulse, and positive wall charges are accumulated on the address electrode, and the voltage applied to the cells, to which the Address pulse (70V~75V) has been applied, becomes higher than the discharge voltage. An address Discharge occurs as a result. Since the Scan and Data pulse is applied one line at a time as above, the address time of PDP is very long.

4) IDS Pulse (InDependent Sustain Pulse)

Since an Odd Scan is performed first, the Odd line output sustains optical twice during the IDS section. At this time, a Sustain Discharge does not occur for the Even line because the Even line is not scanned.

5) CPS Pulse (ComPare Sustain Pulse)

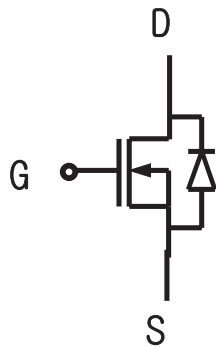
By floating the Odd line that caused the Sustain Discharge in the IDS section to the V_{scan-h} level, and introducing the Sustain Discharge only for Even lines, it compensates for the optical output difference between the Even and Odd lines.

6) CMS Pulse (ComMon Sustain Pulse)

Actual optical is output during the common Sustain Discharge section.

■ Mechanism of the FET Operation and High-Voltage Switching

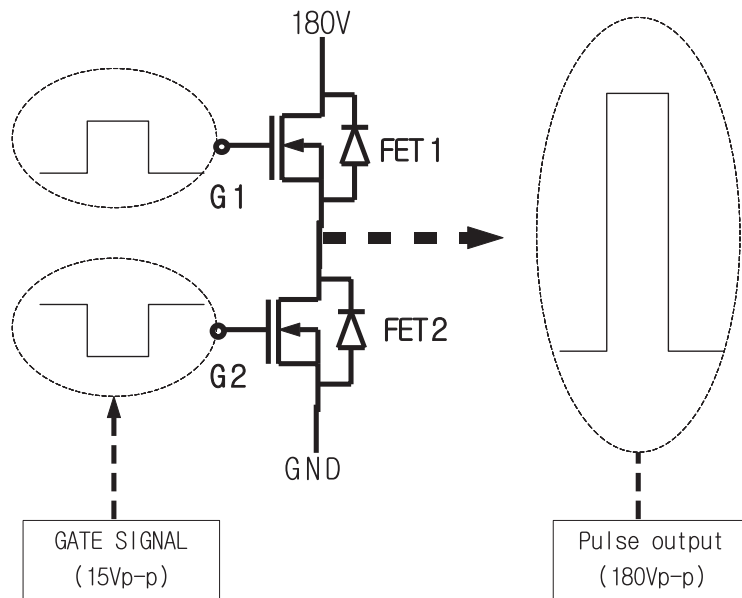
Mechanism of the FET Operation



G : Gate
S : Source
D : Drain

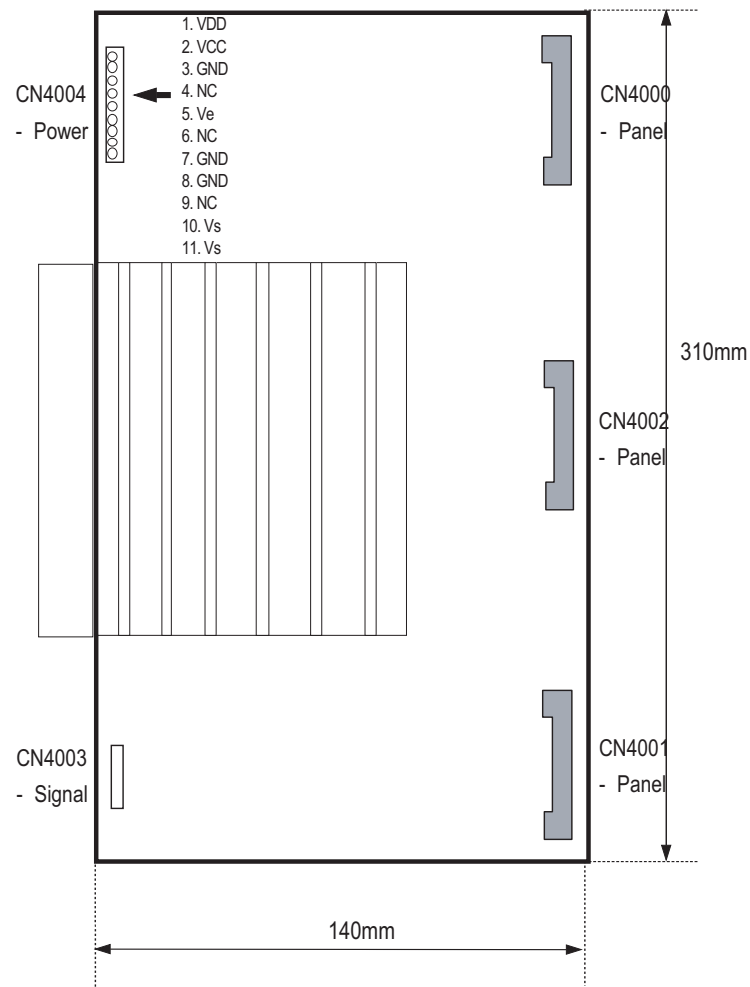
- 1) When the signal is output to the gate, (positive electric potential) FET short circuits (i.e. Conductor of resistance 0)
- 2) When no signal is output to the gate (GND), FET changes to an open circuit (i.e. an insulator of resistance ∞).

High-Voltage Switching of the FET Operation

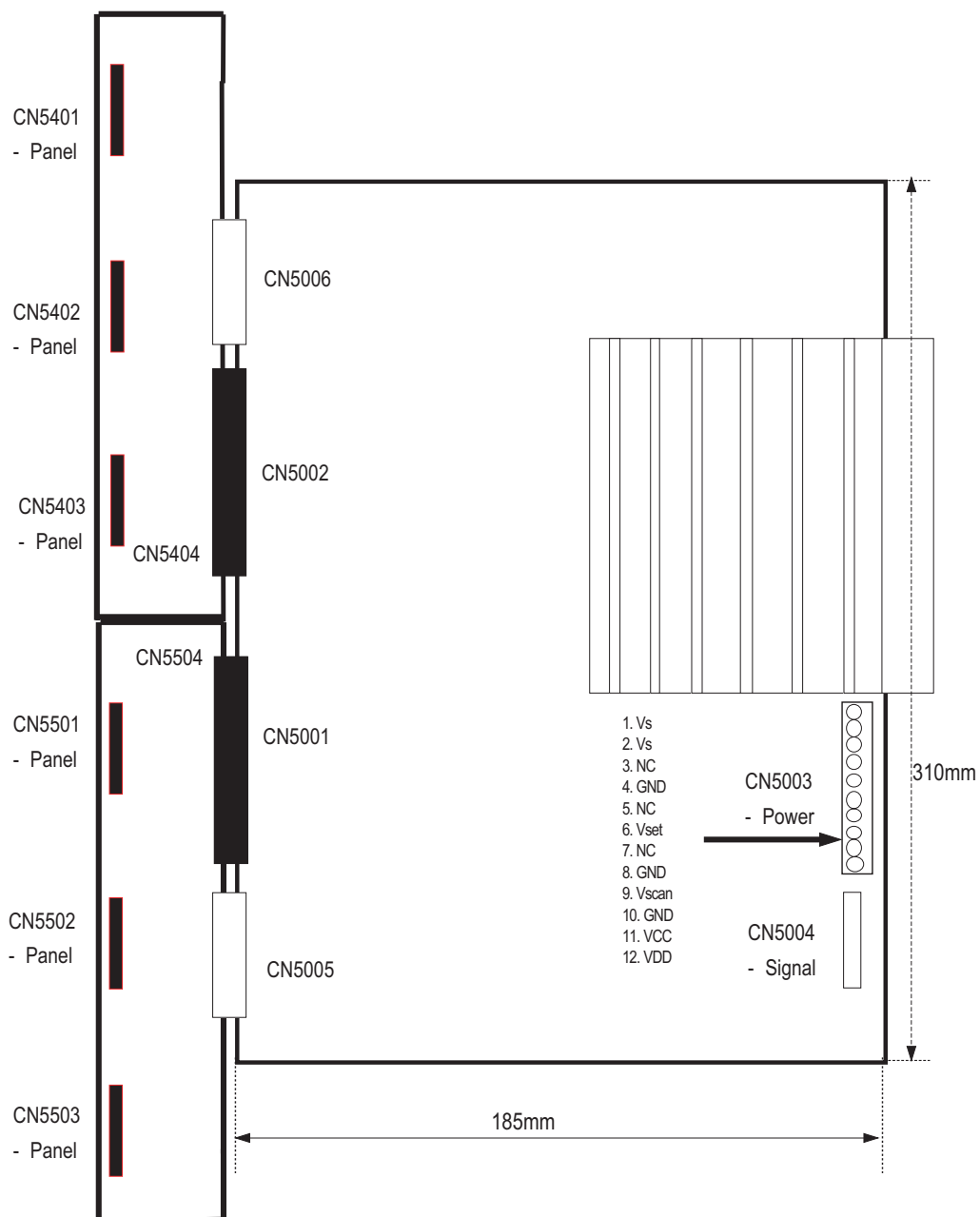


- 1) When no signal is applied to G1, FET1 is opened and when the signal is applied to G2, FET2 short circuits, GND is output via the output terminal.
- 2) When a signal is applied to G1, FET1 short circuits and when no signal is applied to G2, FET2 is opened, and 180V is output via the output terminal.

■ Drive Board Connector Layout
1) X-Main



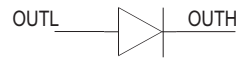
2) Y-Main



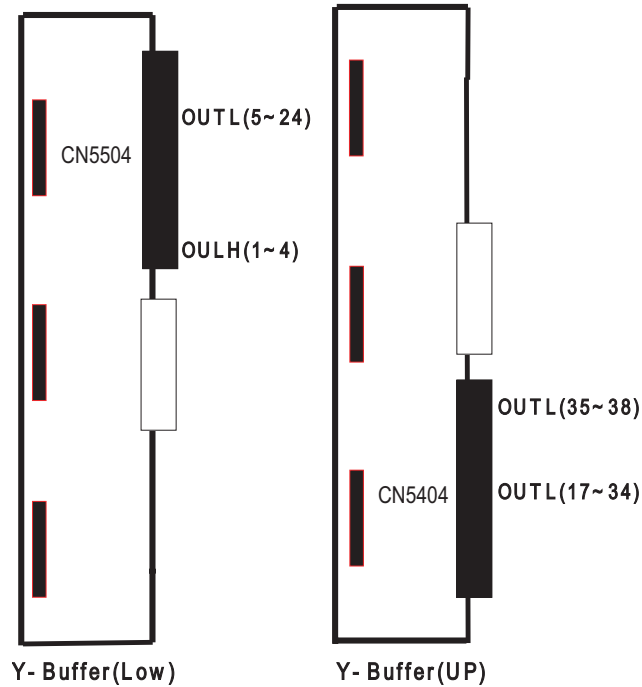
■ Troubleshooting the Drive Board

1) Y Buffer

- To check whether the Y Main board is properly working, check the operation of the Y Buffer first.
- Separate the connector of the Y Buffer from the Y Main board
- Check OUTL and OUTH and confirm that the forward voltage reduction is between 0.4V ~ 0.5V.
 UP - CN5407 1~10pin - OUTH / 11~33pin - OUTL
 LOW - CN5507 50~41pin - OUTH / 40~17pin - OUTL

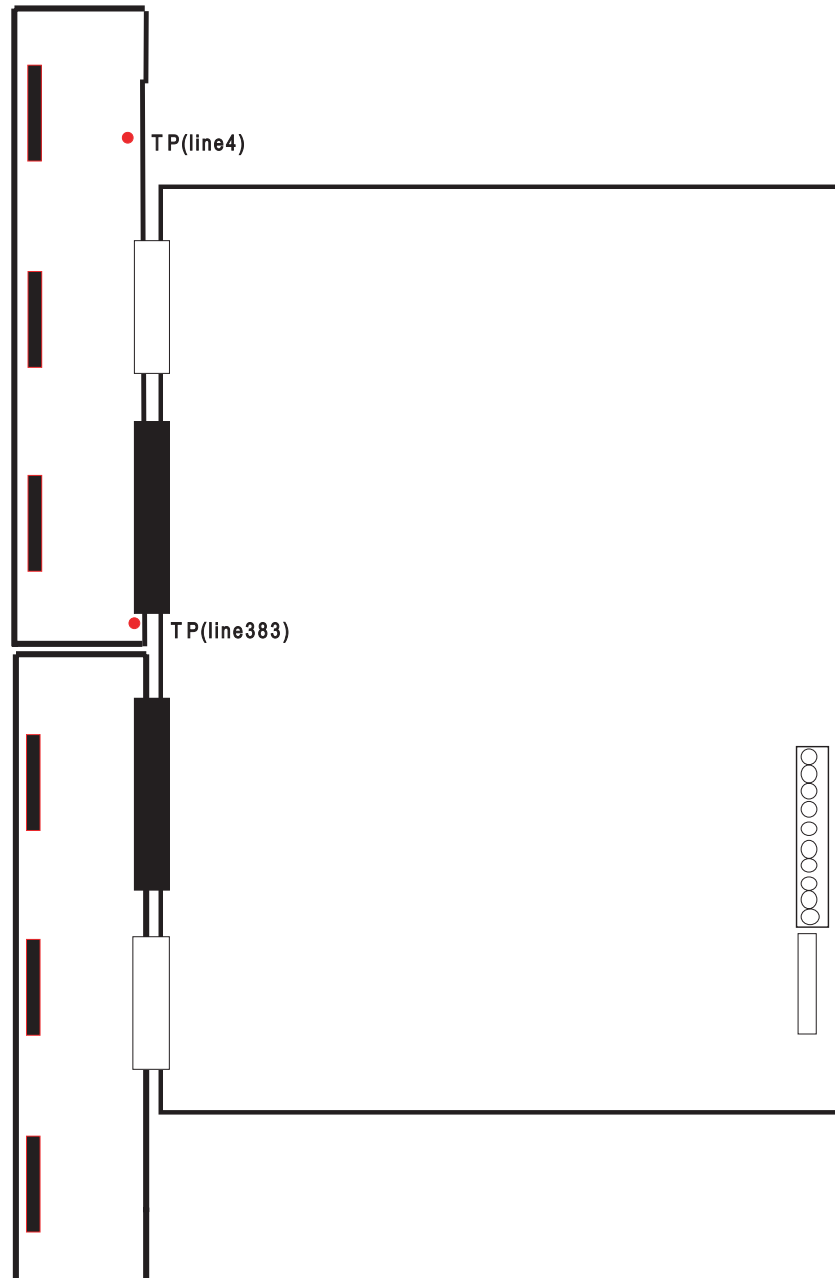


- In addition, the resistance between the points must be higher than a few kΩ .

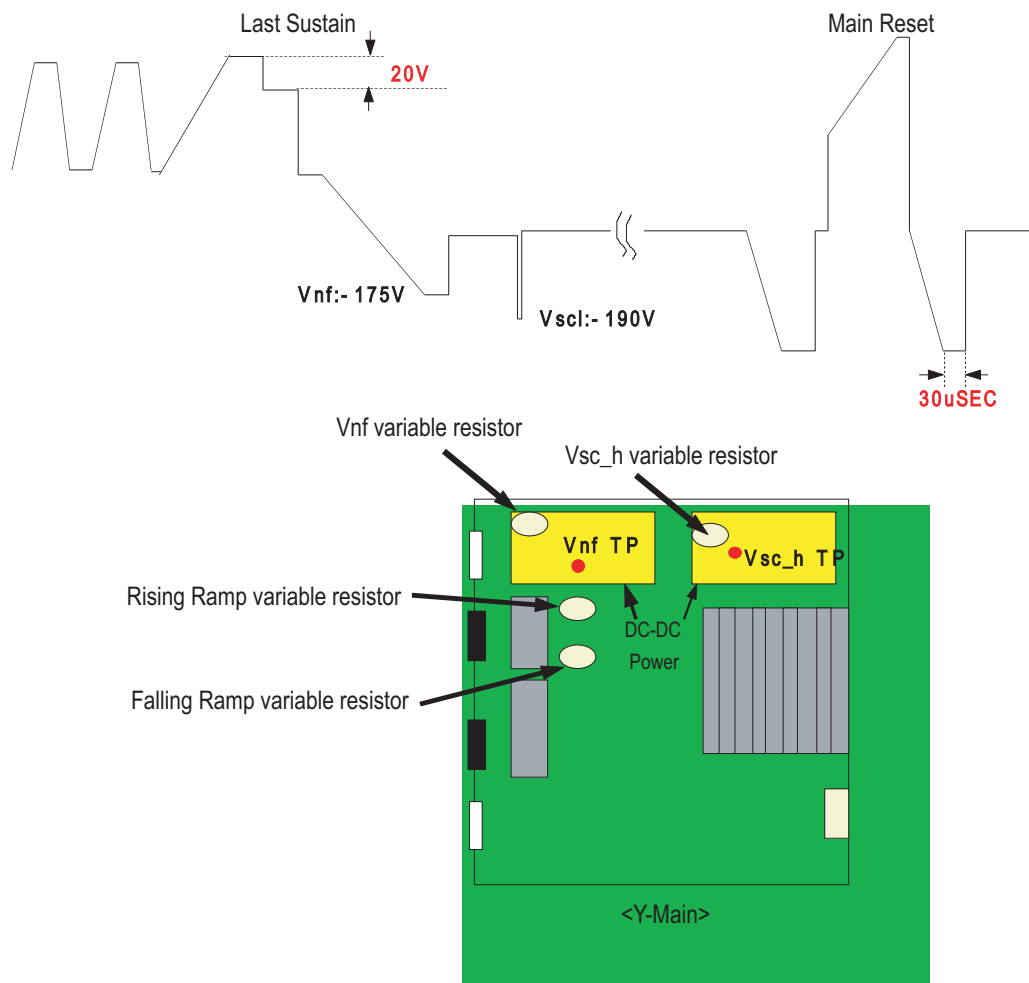


2) Y Main

- Connect the Y Main and Y Buffer, and confirm that the output from TP (line4, line383) of the Y Buffer UP is the same as #Attachment 1 when the power is supplied.



- Adjust the drive waveform so that the last sustain (rising: 15V) and the main reset (falling: 30uSec) are the same as those in the figure.



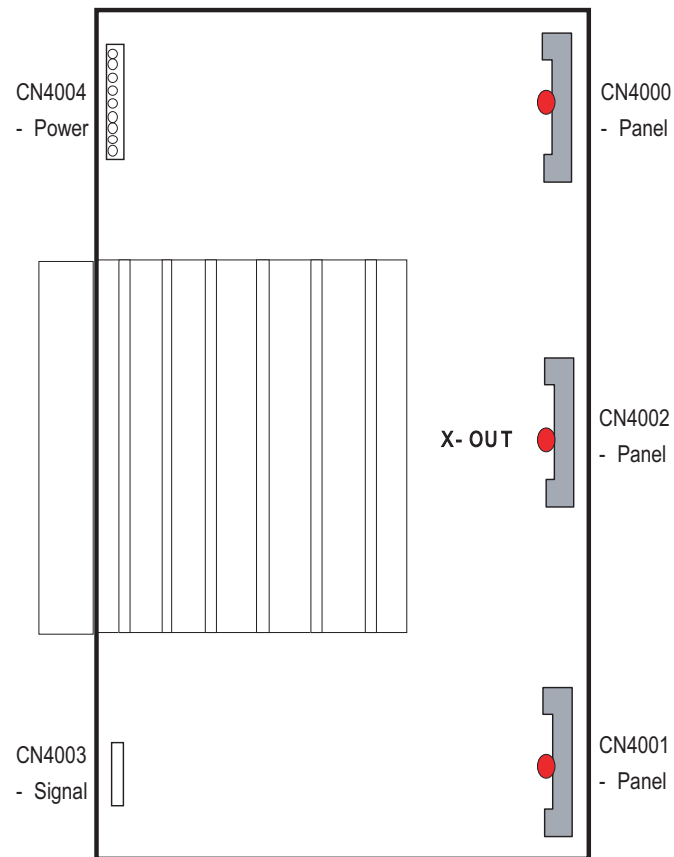
※ The Vsc_h and Vnf voltages are controlled by the DC-DC power part of the Y Main board.

<Voltage Adjustment Specifications>

Vset	Vs	Vsc_l	Vsc_h	Ve	Va	Vnf
195V	210V	-190V	-70V	100V	70V	-175

3) X

- Check that the output of X-Out of the X board follows the waveform of #Attachment 2 when the power is supplied.



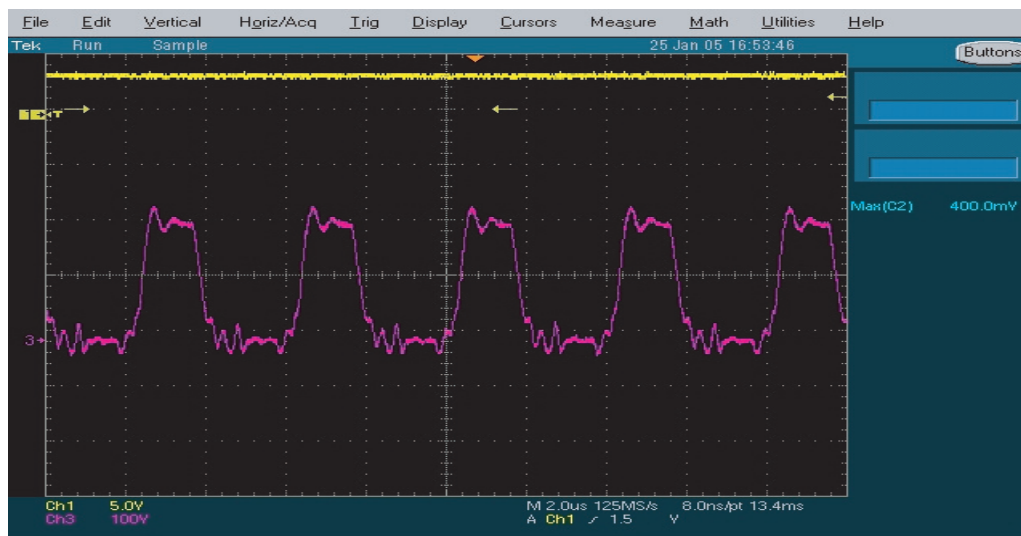
※ Attachment 1

■ Y Output Waveform

The Scan Waveform Must Be Observed



Y Output Waveform (200us/div, 100V/div)



1us/div, 100V/div (Sustain Waveform)

※ Attachment 2

■ X Output Waveform



X Output Waveform (200us/div, 100V/div)



2us/div, 100V/div (Sustain Waveform)

MEMO

14. Reference Information

14-1 Other issues related to other products

Problem	Descriptions
A fixed screen can cause permanent damage to the TV Braun tube.	Braun, PDP and LCD TVs can all be damaged. When a still image is displayed in a sequence, this can leave stains or after-images due to the characteristics of the panel. However, the DLP TV has the advantage that no stains or after-images are left on the screen. The DLP TV has mirror pixels on the DMD panel that project the beam onto the screen, in which the mirror is a digital representation of 0s and 1s, leaving no trace of light. The mirror returns to a blank state so that no stains or after-images are left.
Length of DVI Cable / PC RGB Cable	<ul style="list-style-type: none"> - A too long DVI cable may cause a malfunction or degradation of the visual quality due to an attenuation of the signal. There is no recommendation for the cable length at present. In general, although a cable length of up to 5 meters should work, please check if video is properly displayed on the screen after connecting. If you think the length of the cable is longer than for normal use, check the visual quality of the video on the screen and shorten the length, if necessary. - This also applies to the PC RGB (D-Sub) cable. When the length of the cable is longer than for normal use, video may not be displayed on the screen. In this case, shorten the cable length.
When a digitally distributed TV user receives HD-rated broadcasts:	The digital distributed TV (Ready Technique) can render HD sources as HD-rated. However, you need to install a set-top box for this purpose. The digital TV alone cannot render HD broadcasting as HD-rated. Install the formal set-top box for HD broadcasts.
When a digital distributed TV user selects normal size (4:3) to receive SD-rated digital broadcasts:	The digitally distributed TV (Ready Technique) renders any broadcasting service as SD-rated. However, when connected to a set-top box, the digital TV renders HD broadcasts as HD-rated and renders SD as SD-rated. The screen size is scaled to 4:3.
When a digitally built-in TV user receives SD (air) broadcasting:	The digitally integrated TV ("built-in" type) renders SD broadcasting as SD-rated. This can be understood easily. Even a high-resolution TV cannot improve a low resolution picture into high quality. In contrast, an SD-rated TV cannot represent HD broadcasting as HD because the resolution of the TV is lower than the original.
When selecting a picture size of 4:3 in connection with a computer or a multimedia device:	The representation capability of SD or HD-rated depend entirely on the TV set. The HD TV can render HD broadcasting as HD-rated only when it receives HD sources. In the meantime, the HD TV renders SD as SD-rated when it receives SD sources. The picture size has nothing to do with the resolution; TV models like SVP-XXL3HD or SVP-XXL6HD have a size adjustment feature to 16:9, 4:3, Panorama, Zoom1, Zoom2 and Auto Wide. This is about the aspect ratio of the top and bottom boundaries to the overall screen and users can select their preference.

■ SD/HD broadcasts and the TV's display capability are related

1. A digital broadcast should be transmitted in wide screen (an aspect ratio of 16:9) HD. If the broadcasting station converts a conventional program created in normal screen (aspect ratio of 4:3) into a digital signal and broadcasts the signal, the left and right of the picture will not be displayed.

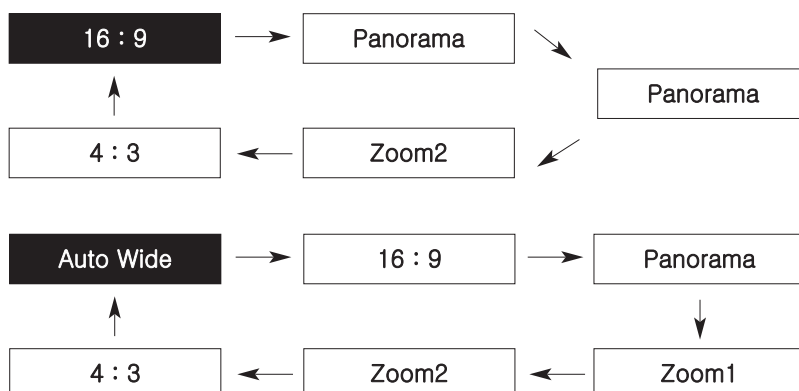
This symptom also appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.

- * When watching an SD (normal) broadcast through a Digital (Wide) TV (480P normal broadcast)
- * When watching an SD (normal) broadcast through a Digital Ready (Wide) TV (Using a set-top-box)
- * When watching an analog (normal) broadcast through a wide TV
(When watching a broadcast after changing the aspect ratio of the TV from 16:9 (wide screen) to 4:3)

2. When watching a DVD title or video tape in wide screen (21:9) through a wide (16:9) TV, watching video from a computer or game console by selecting the aspect ratio to 4:3, or watching video from a DVD, VCR, computer or game console through a wide TV by selecting the aspect ratio to normal (4:3) or wide (21:9), the left and right, or top and bottom of the picture will not be displayed.

This symptom appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.

■ Changing the Order of the Picture Size for 16:9 Display Devices



■ Changing the Order of the Picture Size for DTV 1080i/720p Sources



■ Restrictions

1. When you want to change the picture size in PIP 'ON', you must turn the PIP off before changing the size.
However, you can change the main picture size even in PIP ON for products with no restrictions.
2. When the picture size is not Normal (4:3 for 4:3 display devices, 16:9 for 16:9 display devices) and you turn PIP on, the picture size is changed to Normal.
However, you can turn PIP on without changing the picture size for products with no restrictions.
3. In the OSD notation for the picture size, 16:9 is represented as "Wide" instead of "16:9" for devices other than with 16:9 displays.
Ex: For LCD 15:9 devices, "Wide" is displayed on the OSD instead of "16:9".
4. The picture size can be changed even in the blue screen.
However, the picture size should be controlled by the product specifications if the change is impossible due to hardware restrictions.

14-2 Technical Terms

Virtual Channel

In digital channels, a virtual channel is used. A virtual channel is a function that enables users to watch a channel by selecting a virtual channel number regardless of the region of the user. Run Auto Channel Scan for digital broadcasts, tune in to a UHF channel number according to the region for terrestrial broadcasts, or tune into a channel number allocated by the cable broadcasting station for a cable TV network, and then select a displayed virtual channel.

For example, even if you tune into channels UHF 14(MBC), 15(KBS1), 16(SBS), 17(KBS2) and 18(EBS) broadcast from Kwanak mountain in Seoul, you can watch the channels using virtual channels such as 11-1(MBC), 9-1(KBS1), 6-1(SBS), 7-1(KBS2) and 10-1(EBS) regardless of your region and the actual local channel number. The virtual channel numbers may be used nationwide, but the virtual channel numbers may vary depending on the local broadcasting stations.

(Since the digital channel numbers may vary depending on your region and can be changed by the broadcasting policy, ask your local broadcasting station or regional cable TV network company about the channel numbers.) If the virtual channel numbers are saved and the TV set can receive digital broadcasting, you can watch a digital channel by pressing the DTV+ button and pressing the first two digits of the corresponding virtual channel number.

Custom Color Adjustment

Using this function, a user can adjust the color according to personal preferences (Red, Grass-Color, Sky-Color, Gold-Color, Skin-Color, White, Standard, Custom) without affecting other colors using automatic selection mode or fine adjustment mode.

Simultaneous Screen

Using this function, a user can view two video signals from separate video sources on a single screen at the same time. For example, you can watch TV and video simultaneously.

Dolby Digital

This is the digital sound standard developed by the Dolby Laboratory. You can select your preferred digital surround mode after connecting external speakers.

Digital Broadcasting

Digital Broadcasting is a television broadcasting signal digitized and transmitted according to the United States' terrestrial digital broadcast standard, or ATSC.

Mono

A type of audio interface that transmits the audio signal through a single channel only.

Through a mono interface, it is hard to experience stereophonic sound and the sound is played using only one speaker.

Reception Sensitivity Amplification (LNA)

A signal amplification technique that amplifies a weak broadcasting signal by applying satellite technology to provide better visual quality even for users in regions where only a weak broadcasting signal is available. (LNA: Low Noise Amplifier)

Sub Woofer

A Sub Woofer is a speaker for ultra bass sound output only whose frequency is as low as 150Hz. There are two types: an active type which includes an amplifier, and a passive type, which requires an additional amplifier.

Stereo

A type of audio interface that transmits audio signal through 2 channels.

Stereo transmits audio signals for right and left sound so that you can experience stereophonic sound, and the sound is played through 2 speakers.

Partial Color Blind Person Mode

Using this function, a user can adjust the red, green or blue colors according to the preferences of the partially color-blind person so that he or she can view the clearest possible picture on the screen.

Analog Broadcasting

Analog Broadcasting is a television broadcasting signal transmitted according to the NTSC standard.

ANTENNA IN Port

The port connecting the TV aerial via a coaxial cable. It is generally used for watching public broadcast programs.

English Caption

A function that displays English captions or text information included in the broadcast signal or video tape. You can use this function for your English studies by watching AFKN or CC marked video tapes.

Video/Audio Ports

You may experience poor visual and audio quality when watching a video tape on channel 3 or 4 through the antenna cable. You can experience better visual and audio quality by connecting the TV and VCR through the Video/Audio ports. The video port is in yellow, and the audio ports are in white and red.

Wide Screen

Wide Screen refers to a screen that is horizontally longer than a conventional TV screen.

While the aspect ratio of a normal TV is 4 : 3, that of a wide screen is 16 : 9.

External Input

External Input is a connected video device such as a VCR, camcorder, DTV receiver, DVD, etc. as a video source.

Satellite Broadcasting

Satellite Broadcasting transmits programs via satellite so that a program can be viable in all areas at a high visual and sound quality. Approximately 100 channels including public broadcast channels are provided. To view a satellite broadcast, you have to install an additional receiver.

Wire Broadcasting

Wire Broadcasting refers to movie, entertainment and educational programs transmitted by a broadcasting station within a hotel or school.

Audio Multimix

Audio Multimix provides 2 audio languages when foreign movie, drama, news, etc. are broadcast. You can select and listen to one of the supported languages or you can select and listen to both languages simultaneously.

After-Image Protection

Using this function, a user can configure the options necessary for protecting the PDP TV screen.

Power Saving Mode

This function adjusts the screen brightness according to the ambient brightness so as to conserve power.

Component Port

The Component Port transmits a separate luminance signal as well as the green, blue, and red color signal and provides the best quality of all video connection types.

Cable Broadcasting

Cable Broadcasting transmits programs via cable instead of via the air. To view cable broadcasting, you have to subscribe to your local cable broadcast service provider and install an additional receiver.

Tuner

A device that enables the selecting of specific channel frequencies for TV or radio.

Panorama Screen

This refers to a screen that corrects the picture distortion due to a screen size mismatch on the TV.

Progressive Scan

Progressive scan displays the entire frame in a single sweep so as to provide clearer and sharper visual quality.

VESA Plug & Play

This function enables the automatic recognition of devices when connecting the TV to the computer without additional settings.

Anynet

Anynet is an AV network system that enables an easy-to-use AV interface for users by controlling all connected AV devices through the Anynet menu when the AV devices of Samsung Electronics are connected.

DVD (Digital Versatile Disc)

DVD is a large capacity storage media that can store multimedia content such as video, games, audio applications, etc. using MPEG-2 video compression technology on a CD sized disc

DRC

This is a sound quality enhancement function that automatically controls audio output so as to prevent sound quality distortion even at loud volumes and correct the sound to the speakers so that you can listen to the sound at the original sound quality.

DVI (Digital Visual Interface) Port

A DVI interface is a standard for high definition television connectivity. It provides a clear picture on the screen using TMDS which minimizes video signal loss.

DVI-D Cable

A type of DVI connector. Using this cable you can only transmit digital signals.

DVI-I Cable

A type of DVI connector. Using this cable you can transmit either digital or analog signals.

HDMI

This low-voltage power is to supply power to a device that does not use AC power from a wall outlet directly such as a camcorder. A device with a 6-pin connector can receive or relay power to another device. Alternatively, you can use a 6-pin connector without using the two additional pins.

PCM

PCM (Pulse Coded Modulation): This refers to an uncompressed digital signal. Use this for an AV amplifier that does not support 5.1 channels when connecting the audio output via optical or coaxial cable.

SRS TruSurround XT

This function provides 5.1 channel surround sound using 2 channel speakers when inputting a stereo audio signal.

S-VIDEO IN Port

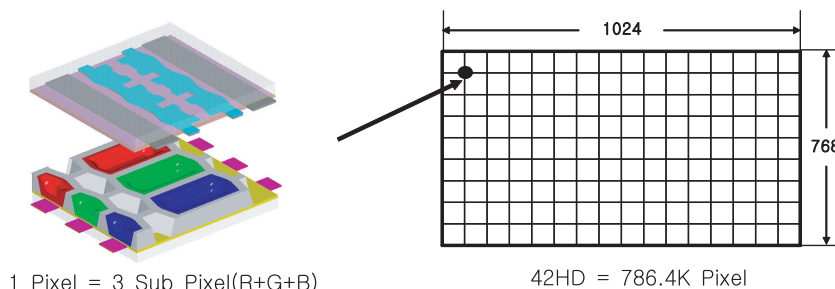
This is called super video. S-Video is a type of video signal which has the video luminance and the color signal separated in order to provide better visual quality.

VHF/UHF

VHF refers to TV channels 2 to 13, and UHF refers to TV channels 14 to 69.

Pixels, Resolution

The pixels are the number of small dots that make up the TV screen. The resolution represents the number of pixels on a screen. For example, if the resolution of a TV is 1024 * 768, it means the width of the screen consists of 1024 pixel columns and the height of the screen consists of 768 pixel rows. In this case, the total number of pixels on the screen is 786,432. The more pixels there are, the higher the visual quality that can be achieved because the picture on the screen is displayed with more pixels and therefore with more detail.



Gradation, Color Depth

Gradation describes the number of gradual brightness levels. Since all information is represented by binary numbers in a digital system, the Gradation is determined by the number of bits used to represent the brightness levels of a pixel on the TV screen. For example, if a pixel is represented by 8 bits, the Gradation is 28 or 256. Since a TV uses the three primary colors of light, R, G and B, the number of possible colors for a pixel is $256 \times 256 \times 256$, 16,777,216, or 16.7 million colors. If 12 bits are used for a pixel, the gradation is 212 or 4096 for a color. Since three colors R, G and B are used, $4096 \times 4096 \times 4096$ or 68.7 billion colors are supported per pixel. Since 68.7 billion colors are far more than 16.7 million colors, the picture will be displayed by far more abundant and natural colors using a 12 bit pixel. That is, since Gradation means the number of brightness levels, color represented by 4096 levels appears more natural than color represented by 256 levels.



Contrast

The contrast is the ratio of brightness of the brightest color to the darkest color. The contrast is calculated by dividing the brightness of the brightest color by the brightness of the darkest color. For example, if the brightness of the darkest color is 1 and the brightness of the brightest color is 3000, then the Contrast is $3000/1$ or 3000. A higher contrast means that a dark color is displayed darker and bright color is displayed brighter so that the screen contrast can be easily distinguished. The contrast differs from the Gradient which means the number of brightness levels.

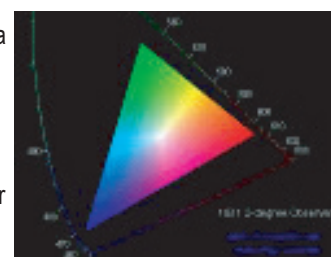
Therefore, if someone says that a 5000:1 contrast displays a color by 5000 levels, he is confusing Contrast with Gradation.

Brightness

Brightness is the brightness per unit screen area, the unit for brightness is candela (cd). For example, 1000cd/m² means the brightness that is measured when 1000 candles are lit within 1 square meters area.

Color Reproductivity

Each color displayed on the TV screen is implemented by a pixel on color coordinates which have an X and Y axis. For example, when a pixel on the X coordinate 0.65 and the Y coordinate 0.74 is displayed as a color and it becomes visible on the TV screen. While the possible color coordinate area is very wide, the color coordinate area of the signal broadcast from a broadcast station is smaller than that of possible color coordinates. Moreover, a TV provides a smaller color coordinate area than that of the signal from the broadcasting station even though the size of the color coordinate area varies depending on the TV model. In general, Color Reproductivity is used as follows: The Color reproductivity of a TV is a certain % of NTSC. This means the TV displays that particular % of the color coordinate area of the NTSC signal broadcast by the broadcasting station. In general, a CRT TV provides the highest functional color reproductivity.



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